The Builder.

VOL. LXIX. NO. 2743. AUGUST 31, 1895.

ILLUSTRATIONS.

Study for Interior of Proposed Church, St. Andrew's, Boscombe.—Mr. H. Wilson, Architect ..... *Extra-Large Page Ink-Photo.*
National Monument to Emperor William I., Berlin.—Herr R. Begas, Sculptor; Herr G. Halmhuber, Architect ..... *Double-Page Ink-Photo.*
Business Premises, Salisbury-square, E.C.—Mr. H. L. Florence, F.R.I.B.A., Architect ..... *Single-Page Photo-Litho.*
Interior, Ashton Grammar School, Dunstable.—Mr. E. R. Robson, F.S.A., F.R.I.B.A., Architect ..... *Single-Page Photo-Litho.*

Blocks in Text.

Plan of Excavations on the Western Slope of the Acropolis ..... Page 148
House, Bar Harbour, Massachusetts ..... „ 152
Unitarian Church, Bar Harbour, Massachusetts ..... Page 153
Plan, St. Andrew's Church, Boscombe ..... „ 154
Diagram illustrating "Student's Column" article ..... Pages 155, 156

CONTENTS.

Recent Excavations on the Western Slope of the Acropolis 147
Notes 149
Association of Municipal and County Engineers 151
House, Bar Harbour, Massachusetts 153
Unitarian Church, Bar Harbour, Massachusetts 153
Competitions 153
Engineering Societies 153
Interior of Proposed Church, St. Andrew's, Boscombe 154
The National Monument to the Emperor William I., at Berlin .. 154
New Offices for Messrs. Edward Lloyd, Limited, 13, Salisbury-square 155
Ashton Grammar School, Dunstable 155
Swansea Board School Competition 155
Durham Municipal Buildings Competition 155
Student's Column: Metals used in Building.—IX. 155
Obituary 156
General Building News 156
Sanitary and Engineering News 157
Foreign and Colonial 158
Miscellaneous 158
Legal 159
Capital and Labour 160
Meetings 160
Recent Patents 60
Some Recent Sales 160
Prices Current of Materials 161
Tenders 161

Recent Excavations on the Western Slope of the Acropolis.—I.

IN laying before our readers an account of Dr. Dörpfeld's recent excavations on the western slope of the Acropolis, it may be well to define at the outset the nature of the various problems involved. Dr. Dörpfeld claims to have discoverd the Panathenaic way. This claim no one disputes. He further claims to have fixed the site of the ancient city spring Kallirrhoë, transformed by Peisistratos into the Enneakrunos—the Nine Fountains. His claim in this last matter is, not unnaturally, disputed; for to place the Enneakrunos where he does is to revolutionise the topography of the primitive city of Athens; it is to draw a sponge clean across the plan of the ancient agora as laboriously imagined by generations of archæologists—nay, more, it is to re-read a *locus classicus* in Thucydides.

The question at issue is a complex one,* we hope to make it clear by taking its factors in the following order. We shall state:—

1. The orthodox view, with the facts on which it claims to be based, evidence which, as we shall see, is mainly literary.

2. The fresh material, the fresh factors introduced into the problem by the recent excavations, as illustrated by the plans accompanying this article.

3. Dr. Dörpfeld's interpretation of that fresh material, the new reading he gives of the Thucydides passage, and the revised view of the topography of ancient Athens, which, by the light of his own excavations, he now offers to the world.

1. *The Orthodox View.*—So long as ancient Athens lay buried below the modern town, the picture archæologists could frame of its topography was necessarily, in the main, a fanciful one, its probabilities depending on the interpretation of passages in ancient historians, travellers, lexicographers, &c. Of these literary accounts one—that of Thucydides—deals avowedly with the most primitive lie of the city, and is of such importance that it must be quoted in full. Thucydides (ii., 15) writes: "Before his time (*i.e.*, that of Theseus) what had been the Acropolis and the ground lying under it, mostly to the south (*καὶ τὸ ὑπ' αὐτὴν πρὸς νότον μάλιστα τετραμένον*) was the city (*πόλις*), and that can be proved, for the sacred places [both of Athene] and of other divinities are on the Acropolis itself, and those that are outside are built chiefly close to that part of the city, *i.e.*, the sanctuary of Olympian Zeus, and the Pythion and the sanctuary of Ge, and that of Dionysos in the Marshes (*ἐν Λίμναις*), to whom the more ancient Dionysia are celebrated on the 12th day of Anthesterion, a festival still observed by the Ionian descendants of the Athenians. And in the same part (*ταυτῇ*) there are other ancient sacred foundations, and near at hand (*ἔγγὺς οὖσῃ*) is the fountain, now called Enneakrunos, from the form given to it by the Tyrants, but, originally, before the springs were covered in, it was called Kallirrhoë. Its water was used by the Athenians on the greatest occasions, and even now they use the water, according to the ancient custom, before marriage rites, and on other sacred occasions. To this day the Acropolis is called by the Athenians Polis, on account of this ancient settlement."

The current orthodox explanation of this familiar passage is briefly this. The old city lay to the south of the Acropolis, in contradistinction to the later agora, which, it is believed, lay to the north—roughly, where the Stoa of Attalos still survives. Existing remains seemed to fit in admirably. The temple of Zeus Olympios lies south, though very much south-east; near to this temple Pausanias saw a Pythion, and also a temenos of Ge, with the title Olympian. As to the sanctuary of Dionysos *ἐν Λίμναις*, it was natural to suppose that it lay somewhere near the present Dionysiac theatre, *i.e.*, directly to the south. There remains the Enneakrunos, the ancient Kallirrhoë; and this was easily, and it seemed satisfactorily, placed on the Ilissus, at the spot where the women of Athens still do their washing. It is called to this day Kallirrhoë, and the "Etymologicon Magnum" distinctly states: "Enneakrunos, a spring at Athens, on the Ilissus, formerly Kallirrhoë."

Against this view, as it seemed at first sight, there was only one objection, though, it must be admitted, a serious one. Pausanias (I., 14-1) saw and described the Enneakrunos. He saw and described it, however, not in the section devoted to the Ilissus district, which comes much later, but in his description of the agora. He mentions the temple of Ares, which is indissolubly linked with the Areopagos, and after noting the statues of Harmodios and Aristogeiton, passes to a small group of temples, monuments, &c., which he links together more or less closely. They are—

No connecting link—The Odeon.

"Near to it"—The Enneakrunos.

"Beyond this"—The Temple of Demeter and Kore, *i.e.* the Eleusinion.

"A little further on"—The Temple of Artemis Eukleia.

Where one of these is, there are the rest. To meet this difficulty was invented the theory of the "Enneakrunos episode." It is supposed that Pausanias, without a hint of warning, wanders off half-a-mile, and plants his readers suddenly down on the banks of the Ilissus, whence he as suddenly returns to finish the agora buildings. It must be distinctly understood that this Enneakrunos episode is the purest hypothesis, invented solely and entirely to keep the Enneakrunos on the Ilissus. It is a deliberate sacrifice of Pausanias—a favourite scapegoat—on the shrine of Thucydides. Pausanias, whatever his other shortcomings, is at heart an orderly sight-seer, as the Delphi excavations have abundantly shown, and there is no evidence whatever of dislocation of the text. The difficulty is, however, undoubtedly a grave one. Thucydides seems to say the Enneakrunos lies to the south of the Acropolis. Pausanias, unquestionably, unless he made a sudden leap to the Ilissus, saw it to the west: both are credible witnesses. Dr. Dörpfeld offers a solution, but this must wait over till we have considered—

2. *The Fresh Material Yielded by the Recent Excavations.* — Dr. Dörpfeld has always refused to argue except with the spade; other archæologists might draw up fancy plans of the Panathenaic Way, the agora, with the Stoa Basileios, the Bouleuterion, the Eleusinion &c., conjecturally marked in, but his views remained unpublished. To quote his own words: "It seemed to me purposeless to add another

* The literature respecting the recent excavations on the western slope of the Acropolis is chiefly to be found in the Mittheilungen of the German Institute at Athens. Official reports appear in vols. xvi., p. 443, xvii., p. 90 and 438, and articles by Dr. Dörpfeld, with full exposition of his views, vol. xviii., p. 143, xix., p. 3, and xx., p. 17. From the two last the annexed plans are taken. To this must be added an article (in modern Greek) by Dr. Dörpfeld, in the Ἐφήμιρις Ἀρχαιολογική (1894, p. 1), in answer to a criticism by Γ. Νικολαΐδης (1893, p. 179). The classical passages respecting the Enneakrunos, &c., are most easily accessible in the Corpus of "Schriftquellen zur Topographie von Athen," given in the "Stadtgeschichte von Athen," by Professor Curtius, Berlin, 1894. Full reference to the various monographs that have appeared on the "Enneakrunos Episode" will be found in "Mythology and Monuments of Ancient Athens," by Harrison and Verrall, p. 87.

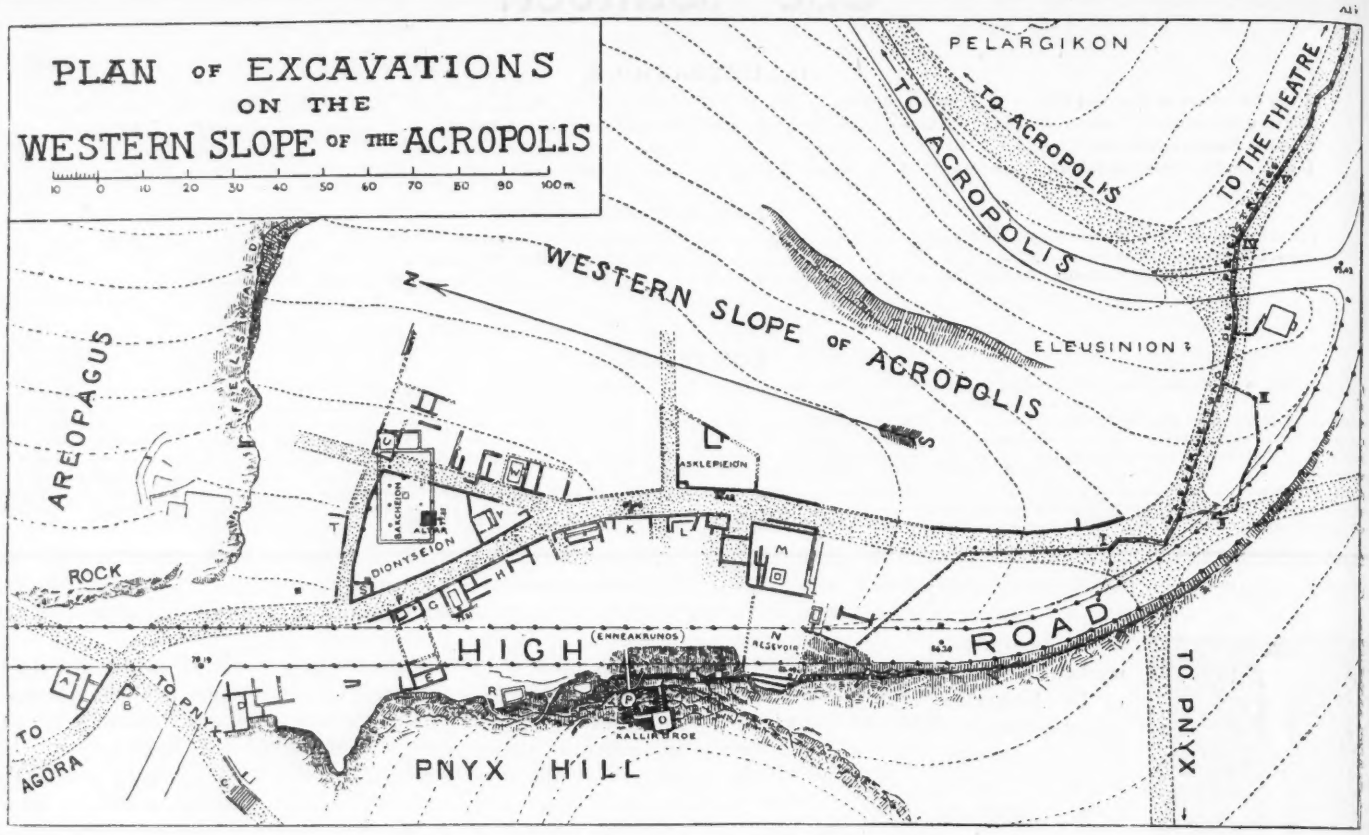


FIG. 1.—*General Plan of the Site and the Excavations.*

to the many theories about ancient Athens, so long as the site itself remained ininterrogated, and not even an attempt had been made to find the actual buildings in question." In his public lectures, however, at Athens he repeatedly stated his views, both as to the direction of the Panathenaic Way and the position of the Enneakrunos, the two main factors with which all the other minor attributions are involved. By his permission, these views appeared in English form in the book on the mythology and monuments of Athens cited in the footnote on last page, and the plan of the agora published there, though it requires modification in detail, remains as a record of his prophecy; whether that prophecy has been fulfilled by the excavations our readers must judge.

Tentative excavations were begun as early as 1887 with a view to fixing the lie of the agora. The site chosen was to the west and north-west of the Areopagos, but the results were not encouraging; a portion of the road leading to the Piræus gate came to light, and the ground-plan of some buildings was discovered, but, owing to the narrowness of the trenches dug they could not be satisfactorily made out. The work was begun again in 1892, but still pursued under great difficulties; the private owners of particular plots of land would only allow excavations to be made on the express condition that the trenches were levelled up again; moreover funds were limited, and work under these conditions both slow and costly. The results were, however, of manifest importance; the ancient road from the Agora to the Acropolis was unmistakably made out, a building inscribed as a Lesche came to light, several private houses, the precinct of a god of healing, the place of assembly of the Iobacchoi with beneath it an ancient sanctuary of Dionysos, and finally the remains of an important fountain to which at present we will give no name. Besides these ground-plans, a number of sculptures and inscriptions came to light, and the Greek Government was at last so impressed by the discoveries that it decided to appropriate the whole of the west slope of the Acropolis, and to hand it over to the German Institute for investigation. The funds necessary for last winter's and the coming season's work were raised by private subscription in Germany.

Turning to the plan, first and foremost we note marked in dotted lines the ancient road to the Acropolis, the famous Panathenaic Way. It can hardly be doubted that we have here the ancient main road to the citadel: it follows roughly the course of the modern road; it is the natural way of ascent to the Acropolis, as natural in 500 B.C. as in 1800 A.D., and yet, by almost a consensus of imaginative archæologists, that road was misplaced and made to run to the north of the Areopagos round its east end by a short but to this day impracticably steep cut. The reason of this error is worth noting. Any professional road-maker, any engineer inspecting the site, would have told at a glance where the ancient road must run if chariots were to ascend in comfort by it. But the archæologist of the last generation was apt to make his plans at home. He was misled by the fact that the only extant agora buildings, *e.g.*, the Stoa of Attalos, the Stoa of the Giants, the Gate of Athene Archegetis, the Stoa of Hadrian, lay to the north. To work in some or all of these into his scheme of the ancient agora, to get his Panathenaic Way to pass them, he sacrificed all such commonplace considerations as convenience of ascent. These buildings have, indeed, to be reckoned with; but for the late commercial Roman agora, not for the primitive city market-place. Their date forbids that.

To return to the ancient road. The first impression is of extreme narrowness, just as at Delphi on the other Sacred Way. It is a narrow Oriental street hemmed in by buildings and sacred precincts, and bounded on either side by walls of polygonal masonry. These were originally, of course, in sight, but as the level of the road rose they gradually disappeared. It is owing to this that in places (marked on the plan, Fig. 1, in black) they are still well preserved. The excavating of the road has been attended with unusual difficulties, because, in places, it borders closely on the modern road, and traffic could not, of course, be suspended. Beneath the road an elaborate system of drainage-pipes has come to light — with shafts by which they could be entered for cleaning purposes. All this complex subject Dr. Dörpfeld proposes to discuss later. Several cross-roads in connexion with the main way are clearly made out and marked on the plan; thus to the left (Fig. 1) is a road up to the Pnyx, and to the right a second road in the same direction. Just at the point where this branches out was an important crossway, the main road passing on to the Acropolis, another branch to the Itonian Gate. On the left-hand side (of the road) various smaller ways branch off; one to the Areopagos, one right round the precinct of Dionysos, another a foot-way straight up to the Acropolis. It is by this foot-way Dr. Dörpfeld thinks that the Athenian maidens came and went to draw water from the spring Kallirrhoë.

Our description of the buildings laid bare may best begin at the northern end of the road (to the left of Fig. 1).* We take the west side first. Walls of Greek date are marked black, later structures are drawn in with double lines. At B, two walls of polygonal (limestone) masonry forming an angle mark distinctly where a road branched off to the Pnyx. The further course of this road is clearly shown by the steps which occur at C. From B to F the direction of the main road is more or less conjectural, as the excavations at this part could not be completed, owing to the modern highway. The building marked D, presumably a private house, helps to fix it, as in all probability it faced the road. Certainty begins again at F, where the old polygonal boundary-walls reappear and continue in good preservation for a considerable distance. At F, we come upon buildings that from inscriptions can be certainly dated as of the sixth and fifth century, B.C. These consist of an open exedra, quadrangular in shape and of polygonal masonry. Inside this precinct is a small shrine with no columns, in front of it a round altar of porous stone. Both material and technique point to the sixth century B.C. To whom the shrine was dedicated is not known. In the course of the next century the little sanctuary must have fallen into disuse. As the level of the road rose, it, once disused, would easily get covered up. That this was actually the case is clearly shown by the fact that a building of the fourth century B.C. was superimposed; it extended right back to the Pnyx rock, and is marked E. Two boundary stones of this later building are still *in situ* in the wall

* The general lie of the Panathenaic Way is best seen in Fig. 1. Additional details of certain buildings will come out more clearly in the enlarged plan of a portion of the site, to be given in our next issue as Fig. 2.

bordering the main road; on each is inscribed ΗΟΡΟΣΛΕΣΧΗΣ, so the later building is known to be a Lesche.

Immediately next to the south (G) comes a building of polygonal limestone masonry; two inscriptions show that the building was mortgaged, and must, therefore, have been a private house. At H we come to a building of good Greek masonry and extensive size, twenty-one mètres long. Its ground-plan has not yet been fully explored, but its extent would seem to indicate rather a public than a private structure.

At J, K, and L the walls of a private house of late Roman date, have come to light. It occupied the whole space between the Pnyx and the main road. It was discovered after the drawing of the general plan, Fig. 1, and, therefore, does not appear there, with the exception of just the portion that borders on the road. The house consisted of a large atrium with a peristyle of twelve columns and several small chambers surrounding it; the walls are a patchwork of materials of all kinds, and even the bases of the columns are made up of fragments from other buildings. Below this building an earlier structure came to light, a building consisting of only one chamber, and dating from late Greek or quite early Roman times. In the front wall of this building a stone appears bearing on its side a boundary inscription of the fourth century B.C.; the inscription names a certain Aristodemos of Aphidna as holding a mortgage on the house. Probably this stone does not belong to the building, but was used up from an earlier structure. We cannot, therefore, rely on it for any attribution.

Between this building and the Pnyx rock is a space measuring about 40 by 20 mètres, connected with the main road by an entrance way nearly 10 mètres broad. This is the space occupied in Roman days by the large atrium, and it is here that Dr. Dörpfeld places his Enneakrunos. As we are for the present stating facts only, we must be content to mention that at this point the excavations, when the plan was drawn up, were not completed. They can only be carried on slowly, with great difficulty, and by instalments, as the modern road, planted with trees to either side and in constant use for traffic, passes directly over part of the site.

Setting aside theory—what evidence have we from the excavations of a great system of wells and water-courses at this spot? First, no less than twenty wells have been found close at hand; the excavations were again and again stopped by the standing water, and anyone who visits the site after weeks of drought may still see, with their own eyes, pools of stagnant water. Next, deep in the rock of the Pnyx is a chamber, O, accessible by steps from the modern road, and from O a passage leads down by steps to P, where the water may still be drunk from a standing well. In the back wall of the chamber is a deep niche with an ancient well, in front of which is a basin for water. In winter water still issues from time to time from the rock. In Roman times a pipe leading from the supposed "Enneakrunos" reinforced the water supply.

So far we have evidence of a primitive local water supply adequate for the needs of the ancient citadel, and immediately in front of its gate. Of an artificial water supply brought from a distance in the sixth century B.C. the evidence is still more striking. On the right-hand of the plan is marked the conduit (Wasserleitung) of Peisistratos. This has been distinctly traced from its source in the upper bed of the Ilissos right down to the basin N, into which it debouches. It passes deep down below the Palace gardens and skirts the southern slope of the Acropolis. The exact place where the conduit issues from the Acropolis rock is now determined. The entrance was found about 70 mètres south-east of the basin N, just at the spot where the modern road curves to the east. The portion between the Acropolis and the basin N consists of great *poros* blocks forming a subterranean but accessible canal. From this issue two systems of pipes; the larger, with an inner diameter of 0·19 to 0·22 m., conducts the water underground to the basin N; the other, with a diameter of only 0·12 to 0·14, the end of which is not yet made out, seems to have supplied the Asklepieion. The separate pieces of the pipes are from 0·60 to 0·61 in length, not counting the junction points; they consist of a fine yellowish clay; inside they are protected by a red glaze, outside left rough, excepting that at each end they are glazed, and have two lines of glaze down the middle. The separate sections are soldered together with lead, and provision is made for cleaning them by an elliptical-shaped opening with a cover. It is remarkable that these pipes present the closest analogy to the pipes of the famous aqueduct built by Eupalinos, of Megara, for Polycrates, in Samos. Those interested in this technical question will find these pipes fully described by E. Fabricius in the "Mittheilungen," vol. ix., p. 175, in an illustrated article to which, at the time, we drew attention. One thing is quite clear, that the conduit discovered is, by the character of these pipes, as well as by its masonry, fixed beyond doubt as belonging to the sixth century B.C. Many fragments of the pipes still lie scattered about the excavations. In quite early days these pipes seem to have got crusted with lime deposit from the water—and, indeed, choked up; the water then flowed over the pipes and flooded the main channel to two-thirds of its height; in some places where the rock was soft it seems to have got worn away and fallen in, and portions of the tunnel became useless. New borings were made for about 30 mètres, and new pipes put in; these were quadrangular instead of round, but in the disused portion of the tunnel the old round pipes still lie about.

A further very important point is that, just as at Samos, above the main aqueduct a second tunnel has been bored, and the two communicate at several points: whether they were made at the same time is not clear, nor is the purport of the second tunnel as yet made out.

At intervals of from 30 to 40 mètres both tunnels alike are provided with shafts, which served, when the tunnels were first made, for the clearing away of the rock fragments, and were made use of for the like purpose when the conduit was excavated. These shafts are sunk perpendicularly, and reach up to the surface of the earth: one of them was as deep as 12 mètres, so far below the ground did the conduit lie. At Samos similar shafts have been discovered.

From the main conduit several branches can be traced; they probably occur at places where, in the piercing of the tunnels, veins of water were reached, and they seem to have served to bring to the main conduit subsidiary supplies from the Hill of the Muses and from the Acropolis. It is possible, however, that some of them served to conduct water away from the main conduit.

Only those (as Dr. Dörpfeld remarks in his report) who have taken the trouble to get right down into these tunnels and cross-tunnels, and explore them thoroughly, can form any idea of the magnitude of the work. Sometimes it is possible to stand upright; some portions can only be reached by creeping on the hands and knees; one fact is beyond question, and that is, that in this system of conduits we have what was unquestionably the main artificial water-supply of Athens. Complete plans of the whole system will be issued when the water-course has been entirely explored. So far the tunnel has been followed up to the Theatre of Dionysos, where it runs between the two temples. At this point also its course has been altered in Roman times.

At its other end, the conduit debouches, as mentioned above, into the basin marked N. Here, again, we have to do with an earlier structure and a later Roman reconstruction. The exact size of the original basin, which was much the smaller, cannot now be determined. In early Roman days it was enlarged and deepened, but the exact size of the Roman structure has not been ascertained. The floor of the basin was sunk nearly 1·50 mètres lower, and the like alteration was necessarily made in the pipes for carrying off the water. The exact date of the change cannot be known, but it was considerably previous to the building of the late Roman villa, as at that time the great reservoir had fallen into disuse. The water from the aqueduct, not being needed in any large quantity for the well-house, was carried by pipes to the lower city for the supply of the new Roman market-place. These alterations as to water supply are of the first importance in questions of topography; a change in the direction, or the extension of an aqueduct, is naturally the index of a shifting of population. That this basin, N, was once the reservoir to an important public fountain cannot, then, be doubted: the existence of the modern carriage-road prevents it being completely explored.

The space immediately adjoining the reservoir, N, was occupied, as has been seen, by a large Roman house. The question naturally arises, did this Roman house supersede an earlier building? If so, we may expect to find fragments of the earlier building built into the later. Just such fragments have been found. They consist in part of large blocks of *poros* stone, of which one contains a spout for water, with two openings to it, and covered with a coating of chalk deposit, exactly similar to that seen in the water-courses of modern Athens—in part of blocks of a particular sort of limestone, found in the village of Kara, at the foot of Mount Hymettus. This special limestone was much used for stylobates, and the foundations of buildings in general, in the sixth century B.C. One of these Kara limestone blocks, Dr. Dörpfeld conjectures, belonged to the pavement of the fountain-house; another, from its shape, and from the fact that it bears traces of the constant trickling of water, must have served some purpose in relation to the spout; probably it was a structure like that seen on vase paintings, which received the droppings from above. In one block the ⌐-shaped clamp appears, an infallible sign at Athens of early masonry. All these stones were built into the walls of the Roman house, and quite recently one came to light which is, as it were, the apex of the argument—a large limestone block, in which, obviously, from the outline still clearly to be traced, a lion's head 0·34 m. in size had been inserted. A lion's head was a favourite spout among the Greeks. A well-house then once certainly existed, this much is sure; it is, of course, another question whether that fountain-house was the Enneakrunos.

It only remains to note that the place where the fountain-house once stood was separated off from the building M, Fig. 1, (which lies considerably higher) by an early polygonal retaining wall. M, from the style of its masonry and its mosaic pavement, belongs certainly to Roman times. Whether it was a private or a public building remains uncertain.

(To be continued.)

NOTES.

THE fire service of our country, taken as a whole, has the short-sighted policy of considering that its only duty is to extinguish fires with rapidity; and, as we have often, unfortunately, had occasion to remark, even this fire-fighting is generally carried out in a most rough-and-ready fashion, without consideration of economical principles, theory, and tactics. On the Continent, though the respective departments are not, as a rule, well equipped, protection from fire is making rapid strides on account of the careful co-operation of the service with architects and engineers, and the systematic way in which things are generally managed. It has now been decided to hold a Fire

Congress at Amsterdam next month, at which ample opportunity will be given for the mutual discussion of various important subjects between firemen and members of the technical professions. Instead of the more usual fire brigade tournament and merrymaking, this gathering will be held on similar lines to the meetings of scientific societies. There will be three sections: (1) Fire Prevention, (2) Fire Combating, (3) Fire-resisting Construction, and each division has a number of sub-sections. An influential committee has charge of the arrangements, under the presidency of Captain Meier, of the Amsterdam Brigade, and the patronage of the Dutch Home Secretary and the Mayor of Amsterdam. Among the foreign members of the committee we are glad to notice Mr. T. Blashill, F.R.I.B.A., who will represent English architects, together with Sir Eyre M. Shaw, and other recognised English authorities on practical fire brigade matters. Dutch architects and engineers are represented on the committee by the Presidents of their respective Institutes. Mr. Blashill's paper, we understand, will be on his new London fire-stations, which are far superior to the Continental ones, and hold their own with the American depôts.

IN our opinion, the importance of the granary fire on Hanbury's Wharf, near Blackfriars Bridge, which occurred on Saturday night, is being much overrated by our daily contemporaries. We notice that even the *Times*, a paper which seldom takes much notice of our fires, devotes a column to its description. The *dilettante*, as usual, is more interested in the brilliant blaze on a conspicuous site, than in the more serious side of a catastrophe, which is not so easily seen, and he prefers a showy spectacle of fire brigade work, quite regardless of the results. This conflagration was merely an example of a granary fire on a practically isolated site. There was no wind to fan the flames, but the premises almost appear to have been carefully constructed to facilitate the spread, and this, although we understand them to be of recent date. The result was that the block was nearly completely gutted before the fire brigade could attend in proper force, and the firemen only had to see to the protection of the adjoining property—in this case a comparatively easy task. As usual, we again have an example of the advisability for strengthening our Fire Brigade, more especially in the dangerous part of London, so as to enable a more rapid concentration of a force in cases of emergency without seriously interfering with the protection of the West End and the suburbs, and we again see the results of bad planning and unsuitable construction in dangerous premises. We wonder that, where the Building Act cannot prevent such risks, its place is not taken by strictures from the insurance companies. The latter may not care to assist in the suppression of small fires, as these are known to serve as an advertisement of the ever-existent danger from fire, and bring the companies new business; but the larger conflagrations must occasion losses, which call for some energetic preventive policy on their part.

IT is stated in the *Times* that the house in Chelsea, wherein Turner, leaving his house in Queen Anne-street, Cavendish-square — No. 47 in his time, but lately re-built as No. 23*—lived in retreat during some years, is about to be pulled down. It is No. 119, one of two, at the remoter end of Cheyne-walk, and nearly opposite Lindsey Wharf. The house, set back from the road, has stone steps descending about two feet to its front garden, and an iron balcony on the coping, placed there by Turner himself, who from the roof of this house as well as from the vestry window of St. Mary's, Battersea, used to sketch the sun-sets and landscape effects across the river. He was locally known as "Admiral Booth," or "Puggy Booth," having given the name of "Mrs. Booth" (that, according to one story, of his house-keeper in Queen Anne-street) to the landlady. Here, his identity unknown save to one or two intimate friends, he was discovered by his housekeeper, being then at the point of death, and died on the following day, December 18, 1851, in the front room of the second floor, to the window of which he had been taken, during his last illness, day by day, that he might see the winter scene on the Thames. Whilst at Chelsea Turner had for neighbour in 1846-7, William Dyce, R.A., at No. 4, Cheyne-walk, the house occupied by Maclise for nine years before his death there in 1870, and during December, 1880, the last home of Mrs. J. W. Cross (George Eliot). The old weed-grown river wall of Cheyne-walk, so loved by Turner, with much of the walk, have given place to the new Embankment, begun in 1872; but many of the prospects here are preserved to us in paintings by Peter de Wint, John Varley, C. J. Lewis, and Cecil Lawson. The last-named lived at No. 15, Cheyne-walk (next door to D. G. Rossetti, at No. 16, "Queen's House"); of his local pictures we may mention "Cheyne-walk, 1870," and "Chelsea Embankment, a Lament," 1872.

* The Portland estate office: marked by a commemorative tablet.

CONSIDERABLE damage was done to the roof, the east windows, and other portions of the building by a fire that broke out a few days ago at Appleby Castle, Lord Hothfield's seat. The castle is of ancient origin; it stands in the midst of some earlier earthworks of great size and extent, and together with those of Brougham, Pendragon, and Brough, in the same county, was held by Ranulph de Meschines, lord of the barony of Westmoreland, who in 1088 gave to St. Mary's, York, the churches of St. Lawrence and St. Michael "castelli mei de Appelbi." The keep, popularly known as "Cæsar's Tower," and having an inner and an outer ward, was erected in the beginning of the twelfth century. It is 46 ft. square, about 80 ft. high, and had a vaulted basement, lighted by loopholes and containing a deep well, with three floors above. The battlements and angle-turrets, later in date, were repaired about thirty years since. The buildings to the south-east are attributed to Robert de Veteripont, to whom King John gave Appleby and Burgh; he died in 1228, and was buried in the Temple, London. His great-granddaughter Isabella brought the property in marriage to Roger de Clifford, who rebuilt Brougham Castle. Their descendant John de Clifford, seventh baron, and his son Thomas, built the gate-house, chapel, and hall (1418-54). The castle, dismantled by the Scots, and left in neglect for many years, was repaired by Anne, the famous Countess of Dorset, and Pembroke and Montgomery, daughter and heir of George Clifford, third Earl of Cumberland. She made it her residence, and altered the keep by placing a wall up the middle, and putting newel stairs in two of the angle-turrets, 1651-3. She placed a garrison here under command of Sir Philip Musgrave on the outbreak of the Civil War, but the castle was ultimately surrendered to the Parliamentarians in October, 1648. The Countess died at Brougham Castle on March 22, 1675, and was buried in the chancel of St. Lawrence, Appleby, where is her marble monument with effigy. Her daughter and heir married John, Lord Tufton, who succeeded his father as Earl of Thanet. Thomas, sixth Earl of Thanet, removed the chapel and some other buildings for new private apartments, 1695, using materials from Brough Castle. In 1881 Sir Henry Tufton, Bart., was elevated Lord Hothfield; two years afterwards he built two additional stories over the old "Baron's solar," or chamber. It is stated that none of the valuable pictures and muniments have, fortunately, been injured by the fire; the pictures comprise portraits of the Countess Anne, John, Lord de Clifford (Black-faced Clifford) slain at Towton, and several members of the Clifford, Russell, and Tufton families. In the Pembroke MSS. is an account, by the Countess, of all the repairs she carried out at Appleby; for her love of building, and her various residences in this part of England, she might not inappropriately be compared with Bess of Hardwick, who died in 1607.

THE case of Kershaw *v.* Taylor exposed a curious blot on the Metropolis Management Acts. By the Act of 1855 the duty of repairing sewers lies on the Sanitary Authority, that of repairing drains on the owner of the house, and by the same Act a drain which, without an order of the Sanitary Authority, drains more than one house, is a sewer. In the case under notice, a builder in 1887 built four houses, which he, contrary to the directions of the Sanitary Authority, but without their knowledge (a proper system of drainage having been sanctioned), caused to be drained into one drain. He subsequently sold the houses to different purchasers. The Sanitary Authority later on took legal proceedings to compel the purchaser of the house in which the drain which received the drainage of the several houses was situated to repair it in consequence of its defective condition. Both the Court and the Magistrate from whom the appeal came decided that as the drain was a sewer within the definition of the Metropolis Management Act, 1855, the Sanitary Authority could not compel the owner to repair it. "Here," said Mr. Justice Wright, "the thing is actually a sewer within the definition clause." Consequently, as the Judge again remarked, "the Local Authority are without a remedy." The wrongful act of the builder in the first instance had really placed the subsequent owner of the house in a better position than he would have been in had the builder obeyed the law. On the other hand, it is to be observed that, had the Sanitary Authority exercised a careful supervision over the drainage of the houses when building, they would have seen that the system which they approved had not been carried out, but in its place a faulty and improper system. The necessity for careful supervision of building operations is, therefore, shown to be absolutely necessary, even when a proper system of drainage on paper has been approved.

THE sanitary condition of Ilfracombe, Barnstaple, Bideford, and Clovelly, is the subject of a report by Dr. R. J. Reece to the Local Government Board, giving a great deal of information as to the sanitary condition of these places, which may be of interest to the numerous holiday visitors to North Devon, as well as to permanent residents. Ilfracombe appears to be pretty well looked after by its Sanitary Authority in general, though its water supply, derived from a stream liable to pollution by cattle above the intake, is not immaculate. At one of the hospitals there is no administration block, and the nurses have to sleep in the ward or in the unoccupied ward in direct connexion with it. Dr. Reece pointed out the danger, in diphtheria cases, of allowing the nurses to sleep in the infected atmosphere; and since he gave the warning, no less than four nurses have been attacked. Barnstaple appears to stand well in regard to water supply and its modern drainage and sanitation. There are old and badly-formed drains still down, which are, however, being removed by degrees. At Bideford the water supply is from a collecting area of pasture lands, where the water is very liable to pollution, but appears to be fairly filtered. The town was sewered twenty-three years ago on plans prepared by Mr. Baldwin Latham: the drawback to its drainage system is the existence of catch-pits to collect the solids of the sewage, which are deposited in putrefying masses in these catchpits; they are supposed to be cleaned out once a week, but it appears that this is not systematically attended to. In the villages in the Barn-

staple Rural Sanitary District the sanitation, especially as to the removal of refuse, appears to be in as unsatisfactory a state as it still is in the majority of rural districts. Clovelly, however, appears to have an exceptionally good record in this respect; there is a public scavenger, and ash-bins are emptied three times a week in summer and twice a week in winter. We have again and again urged that in rural districts strict official supervision and action is necessary to ensure attention to sanitary observance, and Clovelly seems an instance of the good effect of such supervision.

A VERY elaborate report on the causes of a recent prevalence of enteric fever at Newport (Isle of Wight) has been furnished to the Local Government Board by Dr. Theodore Thomson. It is illustrated with maps and photographs, and contains the record of an exhaustive investigation made with a view of tracing out the real causes of the prevalence of the disease. Dr. Thomson finally came to the conclusion that the only possible cause that was conterminous in its influence with the spread of the illness was the water-supply. The drainage of the district has indeed many defects, but the possible influence of these did not coincide with the spread of the illness, and attention was therefore concentrated on the water-supply. This, in the borough of Newport, is mainly from a low-lying reservoir, filled from springs which rise through the bottom of the reservoir and are there impounded. Near this reservoir are many houses draining into cesspools in the chalk formation from which the springs arise, the cesspools being "so constructed as to permit leakage of their contents."

"The general trend of the underground water in the chalk in the Carisbrooke Valley would appear to be from the south-west to the north-east, and water flowing on this line towards the waterworks would encounter in its way some of the leaky cesspools referred to. Besides this, however, it has to be borne in mind that the effect of pumping at the waterworks would naturally be to draw thither underground water from points not in the direct line of flow towards the waterworks, and the cesspools in any wider area thus drawn upon would constitute further danger to any water-supply."

Some further details as to special causes of pollution are given, and the report sums up by drawing attention to these circumstances as affording a fresh instance of the dangers attaching to a water-supply from the chalk when the soil of the area from which it is drawn is liable to pollution by sewage matters.

THE good people of Ventnor are very much troubled about the security of the spire of St. Catherine's, the parish church, the upper part of which has long been out of the perpendicular, like the well-known spire of Chesterfield. The church is an ordinary specimen of the poorest Gothic style, that of about fifty years ago, and both it and its tower are covered with stucco and compo; and one of those persons who were employed in erecting it, called it publicly, last week, "a jerry-built structure." At a vestry meeting, held last Monday, the safety of the spire was discussed, when one or two local builders expressed an opinion that, though far from secure, the spire was in no immediate danger of falling; and a general opinion prevailed that it would be wise to take down and rebuild the topmost 18 ft. or 20 ft. at a cost of about 200*l*. The Vicar stated that the leaning of the spire had increased gradually during the last three years, and reminded the meeting that every gale augmented its deviation from the perpendicular. Some of the parishioners present, however, expressed an opinion that a slight repair of the spire would be of little use, and that the best plan would be to take down both the spire and the tower, and to place in the latter a new peal of bells, which would be a real addition to the town. Eventually it was decided by the meeting that the work of pulling down and rebuilding the topmost twenty feet of the spire should be undertaken and commenced forthwith. It may be questioned, however, whether it is wise to spend money on the erection of a spire in a town like Ventnor, where any such structure is of necessity dwarfed by Nature, both St. Catherine's and St. Boniface Downs rising several hundred feet above the top of any steeple that can be built; and it is certain that if a peal of bells is to be put up, it is the security and solidity, not of the spire, but of the tower which supports it, that must be looked to first.

THE special technical office which was formed at Vienna last year, to take charge of the extensive street improvements decided on by the authorities, has now completed the plans for covering in the River Wien and forming an important thoroughfare from the Schönbrunn Palace to the City Park. The distance under consideration is about three miles, and the thoroughfare will also be the line for the new Metropolitan Railway, which is to be run in a cutting. We are pleased to see that quite as much attention is being given to architectural effect as to the more practical side of the scheme, and we have every reason to believe that the proposed thoroughfare will be a great success. A number of open spaces are being formed on the route, and old ones are being remodelled. One of the greatest improvements is in connexion with the Carl's Church, which will now have an imposing aspect; and an extensive square is also being planned in front of the Technical College. The Schwarzenberg Place will be made symmetrical, and the Beethoven Place extended. The width of the new thoroughfare will vary from 200 to 300 ft., and its section at the principal points will mostly show a main roadway of 50 ft. over the river (which is being covered in), with the railway cutting (25 ft.) on the one side, and a "Rotten Row" (16 ft.) on the other. Smaller roadways for heavy traffic (40 ft. each), a broad promenade, and the usual footpaths on the frontage line, complete the width. At some points on the route the promenade, or the Rotten Row, will, however, have to be entirely omitted, the dimensions of the side roadways diminished, and the cutting widened to allow for the station platforms. The City Architect, Herr Berger, is responsible for the scheme, which is in charge of Messrs. Winkler and Mayreder, of whom the latter is the chief architect and the former the civil engineer of the department.

ROMAN remains in France, those of theatres at least, seem to be in considerable danger. We mentioned some little time since the existence of a scheme, favoured by the French Government, for repairing and "doing up" generally the ancient theatre at Orange, and making it a site for the annual representation of leading dramas of the classic age of French literature, the object being to make it a kind of rival to Bayreuth. It appears that the inhabitants of Arles are jealous of the preference shown to Orange, and demand that their Roman theatre rather should be repaired, "restored," and devoted to modern drama. They allege that their theatre is of as much archæological interest as that at Orange, and is in better preservation. This seems to be regarded as so much the better reason for destroying all its archæological value and vulgarising its associations.

ASSOCIATION OF MUNICIPAL AND COUNTY ENGINEERS.

AN Irish district meeting of the Incorporated Association of Municipal and County Engineers was held in Londonderry on Friday and Saturday, August 23 and 24. Mr. E. R. S. Escott, President of the Association presided, and amongst those present were Messrs. H. P. Boulnois, Liverpool; T. De Courcy Meade, Manchester; E. Pritchard, Birmingham; W. Weaver, Kensington; J. Low, Hampstead; J. Cooper, Wimbledon; R. Godfrey, King's Norton; Cooke, Lancaster; Stubbs, Darwen; Wardle, Longton; Shaw, Crewe; Thomas, Bedford; J. Cartwright, Bury; J. Lobley, Hanley; Price, Toxteth Park; Smith, Carlisle; Smith, Dalton-in-Furness; Creer, York; and others.

The Mayor (Alderman J. Bell) first briefly but heartily welcomed the Association to Londonderry.

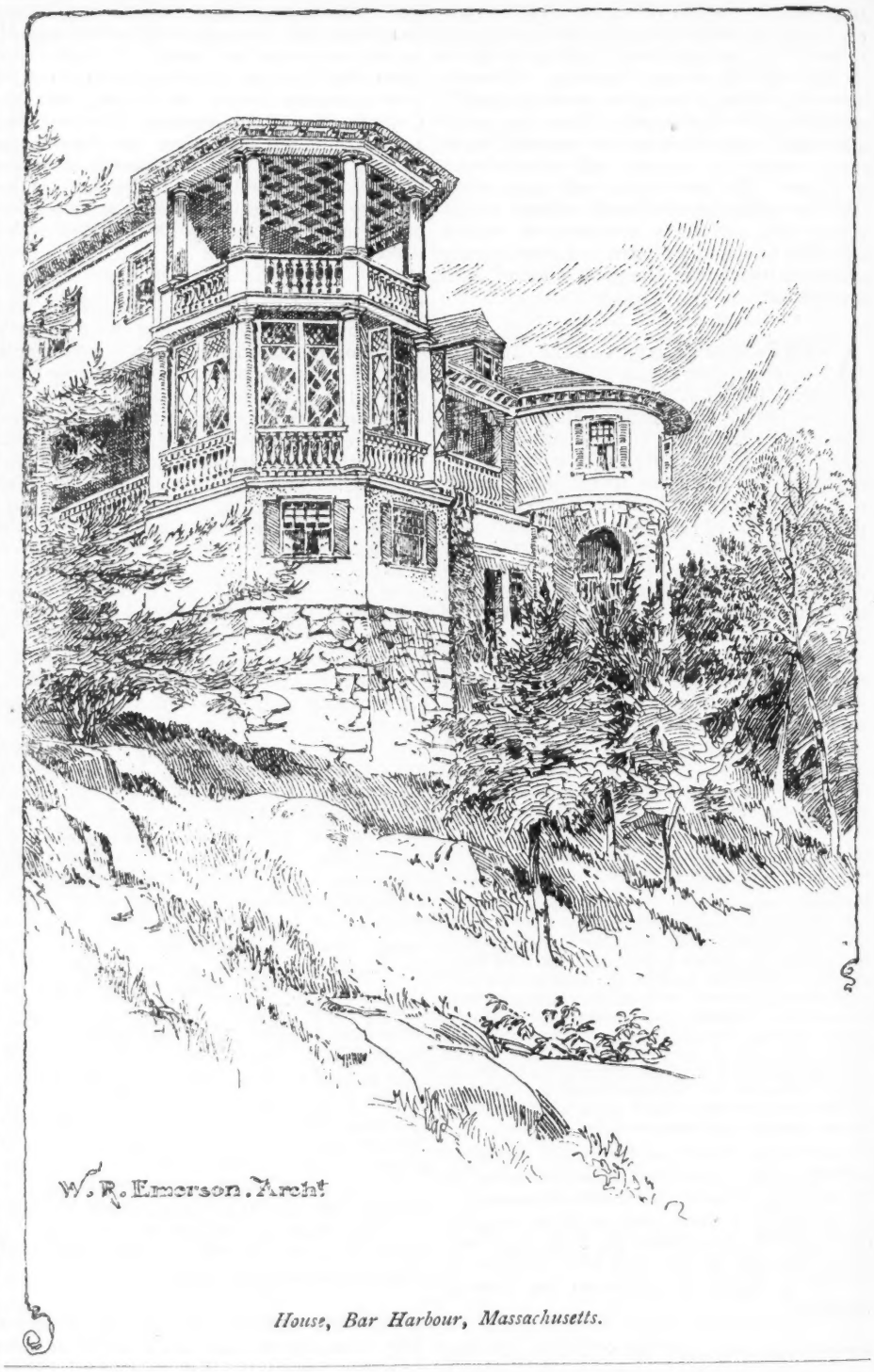
The President proposed a vote of thanks to the Mayor, which was seconded by Mr. H. P. Boulnois (Liverpool), and adopted.

On the proposition of Mr. Sanders (King's County), seconded by Mr. Moore (Meath), Mr. R. H. Dorman, County Surveyor, Armagh, was unanimously re-elected Secretary for the Irish district.

Mr. J. Christie, City Electrical Engineer, then read a paper on the Electric Lighting of the City of Londonderry. The question of electricity supply, he said, both for public and private engineers, had now become of so much importance to municipal engineers, that when he was asked to contribute something to the meeting of the Association, he thought he could not do better than give a brief description of the generating-station, with details of the scheme adopted for the public lighting of Londonderry. In 1893 the Corporation decided to adopt a scheme for the public lighting of the city by means of arc-lamps. The scheme prepared by Mr. Blake was submitted to Dr. John Hopkinson, and, on his approving of the specification, a grant was obtained from the Local Government Board to borrow the necessary estimated capital of 15,000*l*. At present there were two boilers laid down. They were supplied by Penman, of Glasgow, and were of the Lancashire type, 26 ft. long and 7 ft. in diameter, constructed for a working pressure of 125 lbs. per square inch. The feed-water arrangements comprised two duplex double direct-acting pumps, each capable of supplying 900 gallons per hour against the maximum working pressure. The economiser was one of Messrs. Green's, and consisted of ninety-six 4-in. tubes 9 ft. long. The steam was conveyed to the engine-room by two lines of 9-in. wrought-iron pipes having 6-in. branch-pipes to each boiler. In the engine-room were placed along one side three vertical compound condensing-engines of 150 indicated horse-power, made by a local firm of engineers, Messrs. Brown & Sons. The diameters of the cylinders were, high pressure, 11 in.; low pressure, 22 in.; and the stroke, 18 in. The average speed at which they were run was 145 revolutions per minute. Each engine had a jet condenser of its own, placed under the floor of the engine-room, the air-pump being operated off a crank disc on the end of the shaft. The condensing water was supplied to each engine by a separate 4-in. cast-iron pipe laid direct to the river, each pipe being fitted with a clack valve, rose head, and mud box. A 9-in. cast-iron pipe served as a common discharge to all the engines. An auxiliary injection-pipe off the town mains was provided to each engine to assist at starting if the tide was very low or a suction-pipe got choked. The speed of the engines was controlled by Hartnell's patent automatic expansion governor fitted on the crank shaft, which by shifting the angle of advance of the high-pressure eccentric, varied the cut off of the valve to suit the load. The distribution of steam was effected in the high-pressure cylinder by a piston valve admitting the steam in the middle and exhausting at the outer edges, and in the low-pressure cylinder by an ordinary trick slide valve; by this arrangement the high-pressure piston gland was the only one which was subjected to the full working pressure. Each engine drives two dynamos placed on sliding rails one behind the other. The dynamos were of the constant current series type made by Messrs. Siemens Brothers & Company, Limited, London. They were designed for an output of 10 ampères at 3,000 volts at 750 revolutions per minute. They had had them running constantly for nearly forty-eight months, at 2,500 volts, and often had them subjected to the most severe strains possible, and they had given no trouble whatever; the sparking was not excessive, and the wear on the commutators very small. To keep the current constant a very ingenious regulator was provided, which automatically varied the voltage to suit the number of lamps on circuit by rocking the brushes back or forward; with these regulators in gear, it was almost impossible to get more than ten ampères for any time, and they gave the current just as well on short circuit as when the whole resistance of the circuit was on. From the dynamos the current was led to the switchboard by means of insulated cables laid in trenches under the engine-room floor. The switchboard was arranged for six dynamos, and four circuits, and was provided

with short circuit field switches, double pole fuses, and a Swinboure electrostatic volt-meter, to each dynamo, each circuit having a Siemen's ammeter double-pole fuses, and a Thomson-Houston, lightning arrester on each end. The lighting of the city was divided into two sections, each section having two circuits with lamps arranged alternately on different circuits. The cables consisted of $\frac{1}{19}$ copper strand heavily insulated with vulcanised India-rubber served with a covering of bituminised jute armoured with galvanised steel wires, the whole being covered with jute steeped in a preservative compound, and laid in the ground direct. The armouring was earthed at every lamp, and also at the station ends. There were thirty-four miles of this cable laid, the longest circuit being about nine miles round, and the area lighted was one of the largest in the country. During the first six months, after the plant was taken over by the corporation, they had a most unfortunate time of it, through failures of the lamps, cut cables, and other causes incidental to the start of such a large scheme. For a long time this made the electric light most unpopular with many, but Messrs. Siemens successfully surmounted all the many difficulties as they cropped up, and in the very depth of winter entirely relaid the whole of the cables without interrupting the lighting of the city. All these failures were happily a thing of the past, and now they rarely had even a single lamp failure reported. All the lamps were of the well-known Brockie Pell double carbon 32-hour type, so that in winter they only required trimming every second day, whilst in summer once a week sufficed. Each lamp had fitted within itself a cut-out, which, should the carbons burn out, or the rods hang up from any cause, automatically cut the lamp out from the circuit and formed a by-pass for the current to go on to the next lamp. The lamps are fixed on ornamental cast iron pillars 25 ft. high, and pitched from 75 yards to 250 yards apart. In the base of each pillar, inside a locked door, an isolating switch is provided by means of which any separate lamp might be extinguished quite independently of any of the others on the same circuit. Daily insulation resistance tests of all the circuits were taken, and if any one showed below the normal it was carefully watched, should it become dangerously low; the position of the fault was first roughly located by means of a Kelvin electrostatic volt-meter of the ordinary type, reading up to 6,000 volts. One terminal of the instrument was then earthed, and the other terminal connected to the positive and negative ends of the faulty circuit, and two readings obtained, which, assuming the voltage per lamp at 50, read directly the number of lamps from either end about which the fault existed. By referring to the map, they could at once go to almost the exact lamp, and by freeing the ends at the switch, tell, by means of a detector, whether the fault lies in a lamp or a section of the cable between two lamps. This method saved an immense deal of trouble, rendering it unnecessary to split up a long circuit into several parts until the faulty one was found, and if the readings were carefully taken they could always spot the section within two lamps either way. The cost of the whole scheme up to the present amounted to between 18,000*l.* and 19,000*l.* The end of the financial year was not up till November, and he regretted that he could not now give them the exact cost of the public lighting. In winter, during the long nights, the works cost per lamp hour as low as ·65d., and in summer, when the runs were shortest they reached as high as 1·70d. per lamp hour. So far as could be judged the total costs, including everything, should not much exceed 19*l.* per annum, which, considering the number of hours they run, was by no means excessive. No attempt had yet been made by the Corporation to introduce private lighting, but as they had every facility on the site of the present station for the accommodation and working of all the necessary plant for private lighting, and as the town was particularly well situated for the working up of a most lucrative electricity supply business, he had no doubt that before long they would be following the example set them by nearly all other leading municipalities, and wisely keep the valuable monopoly of supplying electricity to the citizens in their own hands by extending their present system and laying down suitable machinery.

Mr. James Perry, County Engineer of Galway, then read a paper on "Municipal Electricity." For six years, as part-owner and occupier, he said, he had been connected with the public and private supply of electricity in Galway. Electrical engineering was forced upon them, and they had got to do their duty in regard to it as they had done their duty by the other human refinements which had preceded it. There had been for some years in the public mind a confusion between electricians and electrical engineers, which would be paralleled by supposing mariners and astronomers to be the same. Electricians were doing good work for engineers, but a mere electrician was not an engineer. Let them take two examples: the scientific gentleman who was mainly responsible for the "London supply" was a man of undoubted ability, and as an electrician his reputation had scarcely suffered by the failure of that venture. The financially most successful man was probably Edison, who was by training neither an engineer nor an electrician (he was reported to have sworn in court that he did not know Ohm's law), but who appeared to be endowed in a high degree with a combination of the qualities of commonsense and ingenuity which made him comparable to our own George Stephenson. Electricity leaving a central station, passing round an external current, and returning to the station, might be compared to an endless rope driven by a pulley in the station. If they conceived of a rope of that kind passing round capstans and through tight places of one kind and another, they would see that when it was made to circulate it would turn the capstans and heat the tight places. Let them call the speed of the rope ampères and the tightness of it volts. As many ampères returned to the central station as left it, but the volts varied from point to point. Now, if they multiplied the tightness or pull by the speed, they had the power transmitted at any point. It was of no great consequence how the units, ampère, and volt had been fixed; the volt meant pressure or tightness of the rope; the ampère meant speed or quantity per second. There they were on familiar ground, because 746 watts were a horse-power. When 1,000 watts run for an hour it was called a Board of Trade unit. A unit of electricity, for which they in Galway charged 3d., used in printing or bottle-washing, or 5d. used for lighting, was equal to $1\frac{1}{3}$ horse-power for one hour. When, however, they had to compare the value of a unit of electricity for lighting purposes with that of 1,000 ft. of gas, they had the elements of lamps and burners coming in in ways which allow of a considerable field for discussion between gas conservatives and electric radicals. It was fair at this time of day to accept Gordon's estimate, made long ago, that 1,000 ft. of gas was equal to ten units of electricity, which would make electricity at 3d. equal to gas at 2s. 6d. With alternating currents electrical transformation was very simple; it was not so simple for continuous currents, and in this was a great point in favour of alternating currents for certain circumstances. There were disadvantages, and they had electricians who showed some partisanship both for continuous and alternating currents; the engineer would use what best suited his special conditions. Series dynamos were used for arc-lamp lighting, and compound dynamos for incandescent-lamp lighting, with accumulators. For five years he had every night run arc-lamps off a shunt dynamo, and he had



House, Bar Harbour, Massachusetts.

charged accumulators with both compound and shunt dynamos. With a turbine at an inefficient speed he had also run incandescent lamps direct from a shunt dynamo without any injury, so that the above rules were in some respect flexible. The electrical arrangements at a central station were absolutely simple. The part in which there was any complication was the accumulator portion. Accumulators, if used for storing, were in first cost very expensive as compared with gas-holders, and if used as regulators they involved some little complexity in connexions and switches. With proper arrangements on the premises for repairing defective plates, the maintenance of accumulators would give very little trouble. Accumulators were specially suitable for water-power, because they allowed of the power being utilised during the whole twenty-four hours. There was a loss of energy in accumulators of about 24 per cent.

Mr. T. de Courcy Meade (Manchester) proposed a vote of thanks to the authors of the papers. He said the order of procedure with electric lighting in Londonderry had been the reverse of that adopted with most of the English towns. In England the usual practice had been to adopt electricity for private lighting and not to undertake public lighting. With regard to Mr. Perry's paper, he did not think any ordinary municipal engineer was likely to undertake an installation of electric lighting without the assistance and advice of an electrical engineer.

Mr. Pritchard, Birmingham, said it would be interesting to know why Londonderry had gone in for public lighting alone. With regard to the use of electricity for tramways the accumulator system was financially a failure.

Mr. Lobley, Hanley, also thought that the light should be supplied to private consumers. In the first six months' working at Hanley they earned sufficient to meet all expenses, including interest on capital and sinking fund charges.

Mr. Broom, St. Helen's, said that a Borough Engineer would be an extremely courageous man who would introduce an electric-lighting installation by himself.

The vote of thanks having been accorded,

Mr. Christie, in reply, said he thought it would have been better for Londonderry to have worked up the public and private lighting together on a small scale, and extended them as it became necessary.

Mr. Perry also acknowledged the vote of thanks.

The Mayor entertained the members to luncheon in the Town Hall. Subsequently a visit was paid to Buncana, where the members were entertained to dinner at the Lough Swilly Hotel.

The meeting on Saturday was held in the Town Hall, Portrush, when a paper was read on "Light Railways and Tramways," by Mr. R. H. Dorman, County Surveyor, Armagh.

HOUSE, BAR HARBOUR, MASSACHUSETTS.

THIS specimen of a house design by the well-known American architect, Mr. W. R. Emerson, is interesting on account of the octagon angle turret in the foreground, with its open story at the top, the treatment of which is both original and picturesque. It is well contrasted with the plain semi-circular bay at the further end of the façade.

UNITARIAN CHURCH, BAR HARBOUR, MASSACHUSETTS.

THIS is, as will be seen, an example of the modern "simple-picturesque" in American architectural design. The treatment of the little tower and cupola is agreeable and picturesque; whether the extreme rusticity of the stone piers is not over-acted may be a question. But the building is one to make an agreeable incident in a country landscape.

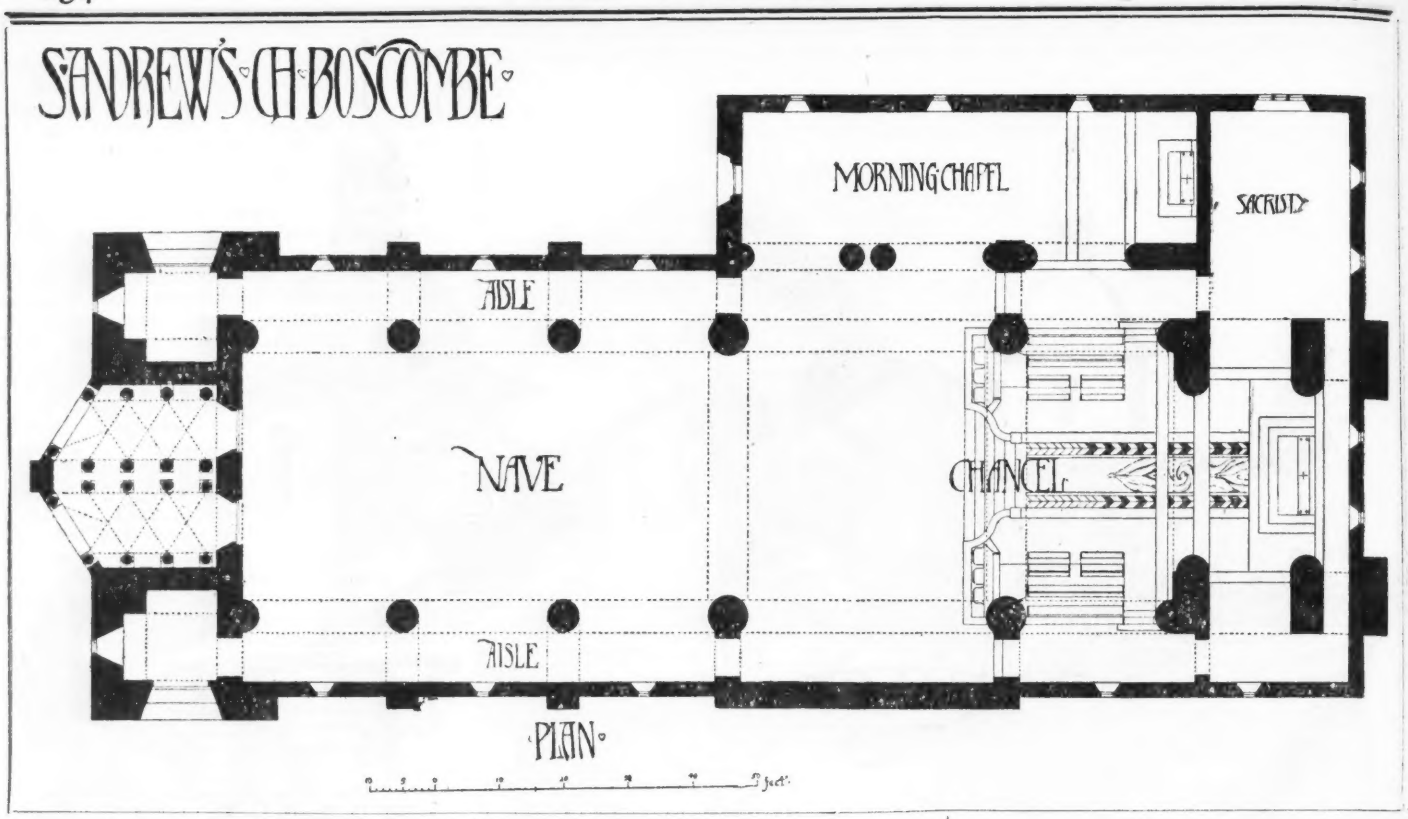
COMPETITIONS.

RECONSTRUCTION OF MUNICIPAL BUILDINGS, ABERDEEN.—The removal of the Watching Department, Burgh Court-room, &c., to the new premises, Lodge-walk, Aberdeen, will take place soon; and a statement showing extensive alterations proposed on the Municipal Buildings has been issued by the Town Council. Altogether, sixty-seven rooms, including public offices, are required. Local architects are invited to submit competitive designs for the reconstruction. A premium of 50*l.* will be given for the first design, and one of 20*l.* for the second. In the event of the Council proceeding with the work, the author of the first design will be employed as architect upon the usual terms of professional remuneration, and in such case the 50*l.* premium will not be paid. It may be mentioned that the local architects have found the memorandum issued to be unintelligible; and, besides, no provision has been made for widening Broad-street to the line of the new buildings at the University.

Y.M.C.A. BUILDINGS, NEWCASTLE. — A selection has just been made of the plans of the proposed new building for the Newcastle Young Men's Christian Association. Three sets of plans had been sent in for competition; and the committee, after consultation with Mr. G. G. Hoskins, F.R.I.B.A., of Darlington, as assessor, have selected those submitted by Mr. J. W. Taylor, F.R.I.B.A., F.S.I., Westgate-road, Newcastle.

THE INSTITUTION OF JUNIOR ENGINEERS.

THE Belgian summer meeting of this Institution, which took place last week, passed off very successfully. Assembling at Harwich, the party, consisting of nearly sixty members, crossed by the Great Eastern Railway s.s. *Ipswich*, and arrived at Antwerp on the 17th inst. Here they were welcomed by M. Royers, Engineer-in-Chief to the Municipality, who conducted them over the extensive docks, and explained the numerous features of interest in connexion therewith. The Musée Plantin and the station of the Compagnie Hydro-Electrique Anversoise were also specially open for inspection. On Monday the members proceeded to Ghent, where MM. Carels' engine works, M. Van Houtte's nursery gardens, and M. de Heurptinne's cotton-spinning mills were seen, the respective proprietors showing the visitors round. In the evening Brussels was reached, and the central electric-light station there was visited under the guidance of Mr. Phibbs. Tuesday was left open so as to afford the opportunity of visiting the various places of popular interest for which the City of Brussels is noted; in the afternoon most of the party made an excursion to the field of Waterloo. Leaving Brussels on Wednesday morning, the members arrived at Liége about noon, and were received by M. Gillon, President of the Association of Engineers from the University of Liége, and by M. Firkets, President of the Liége Section. The afternoon was devoted to visits of the Vieille Montagne Zinc Works at Angleur, under the direction of M. Gillard, secretary of the company, and other gentlemen; and the St. Leonard Locomotive Works, where the chief engineer, M. Shoest, showed the members over. In the evening, at the Hôtel de Suède, a banquet was given in honour of the Institution by the Liége section of the Association of Engineers from the University, Mr. Gillon presiding, faced by M. Firkets. On Thursday, an excursion was made to Verviers, on the invitation of the Chamber of Commerce. Arriving at the Est Station, the President, M. Garot, M. Mullendorff, M. Soubre, Secretary, and other gentlemen of the town met the members, and entering carriages, the party drove to the wool-washing, combing, and dyeing works of MM. Peltzer et fils. The wool-card manufactory of M. Duesberg-Debrez was next visited, after which the party were entertained at luncheon at the Société de l'Harmonie, M. Garot presiding. The wool-spinning, weaving, and finishing works of MM. Peltzer were seen afterwards, and train was then taken for visiting, under the guidance of the Engineer, M. Mahwood, the Gileppe Reservoir, which supplies water to Verviers and Liége. In the evening the Liége



Electric-lighting Station was seen, Mr. Hickson conducting the members through it. Friday's programme comprised a visit to the extensive works of the celebrated Société Cockerill, where the party were welcomed by M. Delloye Matthieu, Chairman, and M. Kroft, Chief Engineer to the Society. Luncheon was subsequently served, and in the afternoon the Val St. Lambert Glass Works were visited, with M. Deprez, General Manager, as guide. In the evening the summer dinner of the Institution was held in the Salle des Vitraux of the Hôtel Mohren, Liége, the Chairman, Mr. H. J. Young, presiding. On Saturday, sectional visits were paid to the Small Arms Works, the Liége Electric Tramway Installation, the works of the Compagnie Internationale d'Electricité, the Liége Gas Works, and M. Foulon's Iron Foundry. The party returned to England in the afternoon. At each place visited throughout the week the Belgians were exceedingly cordial and generous in their welcome, evoking from their visitors expressions of the liveliest appreciation.

Illustrations.

INTERIOR OF PROPOSED CHURCH, ST. ANDREW'S, BOSCOMBE.

UP to the time of going to press we have not received from Mr. Wilson a description of his study for the west front of the proposed church of St. Andrew's, Boscombe, which formed one of the most prominent and striking exhibits in the Architectural Room of the last Royal Academy Exhibition. The exterior view, which was also exhibited, will be illustrated in a future number.

THE NATIONAL MONUMENT TO THE EMPEROR WILLIAM I., AT BERLIN.

THE foundation-stone of this monument to the old German Emperor was laid with much ceremony on Sunday last, and the work is being proceeded with. We have before adverted to the unfortunate discussions in regard to this monument which have taken place at Berlin, and the high-handed manner in which the reigning Emperor has interfered to compel the nation, which is paying for the monument, to accept his ideas as to site and the design of the sculptor whom he specially favours.

The design is by no means generally approved of in Germany, but such as it is, it may be of interest to give an illustration of it. The principal illustration is from a photograph specially taken for us from a small model in the sculptor's studio, and afterwards touched up with body colour and chalk. It is not the most favourable method of illustrating a work of this kind, but it is the best at present procurable.

To recapitulate some of the main events in the history of the monument, we should first mention that Emperor William I. died in March, 1888. A unanimous feeling almost immediately prevailed in the country that a great national monument should be erected as a memorial to a Sovereign who was so much revered, and that no expense on the part of the nation, or effort on the part of the artists, should be spared in the matter. In December, 1888, Parliament placed 5,000*l.* at the disposal of the Government for the purpose of obtaining a suitable design, with the object of facilitating the choice of a site for the memorial, as well as of obtaining some idea as to the kind of monument that would please the nation most. A preliminary competition for "an idea," as it was called, was opened in March, 1889. Of the 5,000*l.*, 1,600*l.* were offered in premiums. Artists throughout Germany welcomed the competition enthusiastically, and no pains were spared by those who entered. Where artists could not themselves raise the money for the expensive models, &c., many generous patrons were found to help them, and eventually 147 designs reached the assessors. The two first premiums were given to architects, whilst the four second awards fell to sculptors. One of the first premiums, awarded to Messrs. Rettig & Pfann, was for the design of a Pantheon outside the town proper, and opposite the new Houses of Parliament on the Königsplatz; the second was won by Herr Bruno Schmitz for an elaborate architectural group, also outside the town. The majority of the designs showed heroic architectural groups for positions in the Thiergarten, of which the Königsplatz just mentioned is a part. Others showed designs for the Pariserplatz, just inside the Brandenburg Gate, whilst only a few indicated miniature architectural or sculptural schemes on the Opera Place, opposite the deceased Emperor's residence, or on the Schlossfreiheit, opposite the historical "Schloss," in which the present Emperor resides.

Public and expert opinion was much in favour of the assessors' award, and though a Pantheon would have required an enormous outlay, the money would at that time have been readily voted by Parliament, or even subscribed voluntarily. The present Emperor was, however, strongly opposed to the idea, and almost immediately had models for a miniature monument opposite his Schloss prepared by his Court Sculptor, Reinhold Begas, the well-known Court Architect, Mr. Ihne, also being consulted. Then followed the farce of a second limited competition among sculptors only for a monument, on the Schlossfreiheit site, which at the time still had a row of houses on it, and had to be cleared by a syndicate who were practically financed by the Emperor, who allowed them to open a lottery. After this came the unfortunate wrangles in Parliament as to the funds, and a general bitterness on the question in art circles, so that the public was soon thoroughly disgusted with the management of the affair. The Court Sculptor, Herr Begas, was finally commissioned by the Emperor to carry out the work, and a *protégé* of Herr Begas, Herr Gustav Halmhuber, was entrusted with the architectural part, in lieu of Mr. Ihne.

The monument as it is now to be carried out can no longer be termed a National Memorial. It may satisfy and please the Emperor, but the country has no interest in it, and satisfies its desire to honour the deceased by locally erecting numerous minor monuments. Some time back we suggested it was not too late to erect a really National Monument at Berlin by voluntary subscription. There is no reason why the equestrian statue should not simply stand as the local memorial, as in other German cities, whilst a Pantheon is erected as a tribute of the nation. This suggestion of ours has been much quoted by the Berlin Press, headed by our architectural contemporary, the *Deutche Bauzeitung*. The most suitable site, as we said before, would be opposite the new Houses of Parliament, at present taken up by a nondescript theatre, known as Kroll's establishment, which is almost as much an eyesore as our Royal Aquarium at Westminster, and in a similar unfortunate position.

The position of Herr Begas' monument for the Schlossfreiheit is explained on the block plan accompanying the illustration. The monument faces the main entrance to the palace, which would dwarf anything standing within 500 ft. of it. The monument will practically be "killed" where it stands. There is no good view to be obtained of it except from the side and back, or from within the palace courtyard through the central *porte cochère*. The fact of two sides dipping into a narrow branch of the river Spree does not add to the dignity of its position, especially as the traffic on the river is of the barge description.

The statue itself shows the deceased Emperor on a charger which is led by an allegorical figure of "Victory." The pediment, which is decorated with symbolical reliefs, has four lions at either corner, whilst figures representing "Peace," and "War," take up positions at the foot of the pediment proper. The figures will be all in bronze, whilst the pediment will be of granite. The height of statue and pediment together is 22 mètres, or 72 ft. The distance between the pediment and the castle opposite is 35 mètres, or 115 ft. The entablature of the castle is about 28 mètres, or 92 ft. above road level, whilst the cupola, which is just over the main entrance, opposite the monument is 65 mètres, or 213 ft. high.

As to the colonnade, there is little to say except that good positions have been arranged for the statues, or busts, of contemporary statesmen and generals. There is much symbolical sculptural decoration, the two quadrigas indicating North and South Germany. The work will be of freestone on a granite base, picked out with bronze, and the busts and statues will be of bronze. The cost of the monument complete was originally estimated at £400,000, but Parliament having decided that not more than £200 000 is to be spent on the gratification of the Emperor's wish, we under-

stand much of the sculptural decoration on the arcade will have to be omitted, or its completion at least postponed, until the country's representatives are more ready to spend the extra thousands on a design which is not to their mind.

Herr Reinhold Begas has already done much good work latterly in the new Houses of Parliament. His chief assistants are Messrs. Bernewitz & Hidding. Herr Halmhuber, the architect, who is responsible for the colonnade and architectural detail of the pediment, is a former assistant of Professor Wallot, and has been successful in several competitions.

NEW OFFICES FOR MESSRS. EDWARD LLOYD, LIMITED, 13, SALISBURY-SQUARE.

REQUIRING more accommodation than was obtainable in the already extensive range of buildings, which reaches from Salisbury-square to Fleet-street and from Salisbury-court to Whitefriars-street, for the production and printing of *Lloyd's Weekly News* and the *Daily Chronicle*, and for the rapidly-increasing business of the Sittingbourne Paper Mills, Messrs. Edward Lloyd have recently incorporated the two houses which formerly separated them from the Church Missionary Society's building in Salisbury-square. The rebuilding of these premises, of which a perspective view is given this week, now provides on the ground floor for the advertising offices of *Lloyd's News*, and on the floors above for the London offices of the Sittingbourne Paper Mills and the board-room of the company; while, in the basement, is placed the additional machinery now found necessary.

The elevation to Salisbury-square, which is shown in the drawing, is built in T.L.B. red bricks with dressings and bands of red Mansfield stone from the Lindley Quarries. The ornamental bronze tablets over the ground floor windows were supplied by the Coalbrookdale Company, and the boundary railings by Messrs. Longden & Co. The windows throughout are fitted with Messrs. Burt & Potts' casements.

The floors of the building are fire-proof, the work of Messrs. Willis & Astley; and the ornamental ceilings are of fibrous plaster, made by Mr. J. M. Boekbinder. The staircase, which rises to the third floor, is of oak, with teak treads, and has a wall dado of Whitefriars glass tiles, supplied by Messrs. Powell & Co. The internal fittings are also of oak, and, with the staircase, were carried out by Messrs. R. E. Worsley & Co., the oak mantels being made by Mr. Charles Hindley. The mosaic flooring and the wall tiling were executed by Messrs. W. B. Simpson & Sons, and the electric-light fittings were supplied by Messrs. Faraday & Son.

The work of rebuilding was carried out by Messrs. Edward Lloyd themselves, without the aid of a general contractor, from the designs and under the personal superintendence of the architects, Messrs. Henry L. Florence & Herbert A. Satchell, of Gray's Inn, while Mr. R. Trice acted as clerk of the works.

ASHTON GRAMMAR SCHOOL, DUNSTABLE.

THE new grammar-school at Dunstable, the existence of which arose out of a bequest by Mrs. Ashton, has been so far completed that the hall towards the road has now been added as given in our illustration.

The building, owing to financial reasons (and the delay caused by the Charity Commission), has been built piecemeal, and still lacks various features now always present in such buildings, all of which it is to be hoped will ultimately be added.

The building has been erected from the designs of Mr. E. R. Robson, F.S.A., architect, and built by Mr. Samuel Jerrard, of Lewisham, who died immediately after the completion of the hall.

The situation of Dunstable is very high and bracing, and under the headship of Mr. L. C. R. Thring the school is already quite full of boys.

An exterior view of the school was given in the *Builder* of July 21, 1894.

CHAPEL, CONVENT OF THE CROSS, BOSCOMBE, BOURNEMOUTH.—The Bishop of Portsmouth, the Rev. Dr. John Virtue, has just laid the foundation-stone of a new Catholic Church, to be erected in the rear of the Convent of the Cross, Parkwood-road, Boscombe. The new church is intended to seat 400 worshippers, and has been designed by Mr. J. W. Lunn, of Great Malvern, the contractors being Messrs. Jenkins & Sons, of Portsmouth.

Correspondence.

To the Editor of THE BUILDER.

SWANSEA BOARD SCHOOL COMPETITION.

SIR,—I am very glad to see that you have called attention to the conditions of the above.

The last proposal of the Swansea School Board was even less liberal, as the 4 per cent. offered had also to cover the cost of the preparation of quantities.

A London architect was placed first in the latter case by Mr. Robson, who acted as assessor, and after a great deal of wrangling, the School Board appointed him as architect. I hear that there have been considerably over 100 applications for conditions in the present case, so that, probably, members of the School Board will be confirmed in their belief that they are acting in a fair and generous manner.

I have in vain attempted to get the local architects to take unanimous action in this and similar cases, but with no effect, and it only remains for me to abstain from such local competitions as this, which contain conditions showing a wish to ignore the customs of the profession.

I hope that some of your readers who may have been inclined to compete in this instance will think the matter carefully over, when I think they will be inclined, in the common interest of the profession, to let this and competitions of a like nature alone.

Swansea. H. W. WILLS.

DURHAM MUNICIPAL BUILDINGS COMPETITION.

SIR,—We should like to draw the attention of the other competitors in this latest bit of competition jobbery to the following fact, which seems to have escaped their notice.

Messrs. Barnes & Coates were *not* placed second by the assessor. This we have on unquestionable authority. As a consequence, some hard-working competitor has been swindled out of his well-earned second premium.

We shall be glad if you will kindly give this letter space. Surely it is about time architects combined to put a stop to this shameless jobbery.

TREADWELL & MARTIN.

The Student's Column.

METALS USED IN BUILDING.—IX.

MERCURY.

NATIVE mercury, or quicksilver, occurs but sparingly in the few localities in the world which yield the bulk of mercury ores. On breaking open samples of the latter, however, minute globules are occasionally seen, and as an extremely rare occurrence the native metal is found in cavities in such large quantity as to be taken out in buckets. By far the most important ore is *Cinnabar*, or sulphide of mercury, having about 86·5 per cent of the metal. This ore has been mined since very ancient times, it is the "minium" of old writers, and is identical with "vermilion," when that name is correctly employed. Its use as a pigment was known long before the Christian era; according to Muspratt, Theophrastus (300 B.C.), described the process of the manufacture of vermilion in the dry way. It has also been known to the Chinese, like many other things, for centuries. M. Berthelot remarks* that the ancients were aware of many of the properties of amalgams, and practised fire-gilding.

At the present day the manufacture of vermilion and the amalgamation of silver ores are the chief uses of quicksilver; but it is also extensively employed in fire gilding, for mirror backs, meteorological instruments, &c. On the whole, it cannot be said to be a metal of very varied usefulness, although in some respects it is the most remarkable of substances. The elaborate researches of Mr. Geo. F. Becker† show that these ores have been formed principally along the lines of most profound geological disturbance, *i.e.* in connexion with the elevation of great mountain ranges. The largest mines are at Almaden, in Spain; Idria, in southern Austria; Huancavelica, in Peru; and in the province of Kwei-chau, in China. Others are situated in the mountainous regions of northern Italy; in the province of Ekaterinoslav, Russia; in parts of Australia, Argentina, the Transvaal, &c.

Cinnabar is closely associated with eruptive phenomena, and is, therefore, generally found in igneous rocks, or can be shown to have emanated from these latter. In the neighbourhood of Almaden, diabase (a granitic-looking rock) is found carrying thin "stringers" and pockets of the ore. At Idria there is a tuff related to rhyolite (a volcanic rock); and in Italy, near Monte Amiata, cinnabar is found in lavas, and the famous Vallalta deposit is at the contact between an igneous dyke and Triassic rocks. There are also a considerable number of cases in which the ore is immediately or closely associated with hot springs. In America it is now being deposited from the highly-heated waters of Sulphur Bank, California, and at Steamboat Springs, Nevada. In Europe quicksilver, or its ores, are reported from the fumaroles at Pozzuoli, near Naples, from hot springs in the Puy de Dôme, France, and other places. The recent discovery of the metal at Spring Creek, Bingara, New South Wales, is important as making another valuable contribution to the already vast mineral wealth of that colony. As an illustration of the mode of occurrence of mercury ore we append the following (fig. 7), based on the report of Professor

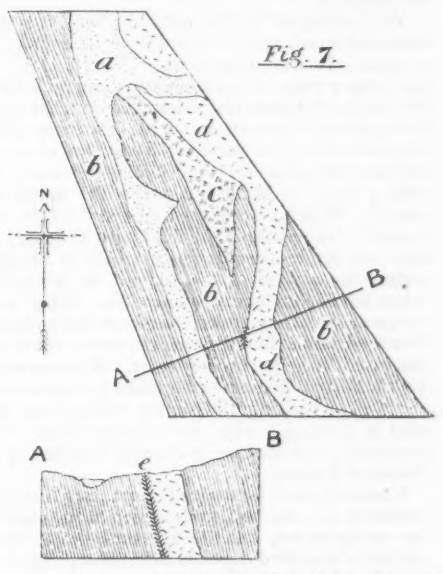


FIG. 7.—*Map and section showing the occurrence of Mercury near Bingara, New South Wales.*

a=Alluvial clays and gravels containing waterworn cinnabar. *b*=Claystone. *c*=Limestone. *d*=Intrusive serpentine. *e*=Serpentine intermixed with claystone and containing cinnabar.

T. W. E. David.* From this we observe that the mercury is found in two ways in the district, viz., in lodes and in alluvial (superficial) deposits. No doubt the ore in the latter was derived from the denudation of the rock enclosing the lode. The dyke in which the metal is found is described as a "decomposed serpentinous rock with interstratified layers of soft purple clay shale." It yields no evidence of the existence in it of any true fissures. The cinnabar is disseminated chiefly throughout the mass of the dyke in small spots "from the size of a small pin's head up to that of a pistol bullet." The productive part of the intrusive rock is about 3 ft. 6 in. in width.

In other localities, quicksilver deposits occur as fissure veins, irregular bodies, impregnations, and "placers." The greatest of all deposits, that at Almaden, contains two large well-developed veins, in part conformable with the surrounding strata and in part cutting them. Many of the smaller Californian deposits are simple veins.

At ordinary temperatures mercury is liquid; when cooled to — 40 deg. C. it solidifies, and is then soft and malleable; heated to 350 deg. C. it boils and volatilises as a heavy colourless vapour. When pure it does not tarnish, and dissolves readily in nitric acid. At ordinary temperatures, also, it forms an amalgam with lead, or zinc, but in order that it shall amalgamate with other metals, mercury must be heated.

SODIUM.

Only two of the numerous sodium compounds are interesting to us, viz., *chloride of sodium* (common salt) and *carbonate of soda* (common soda). Seeing, however, that the latter is for the most part artificially prepared from the former, the chloride is the only one of real use in a commercial sense. The applications both of salt and soda are far too numerous to be given specifically, but with reference to salt it may be remarked

* "Introduction à l'Étude de la Chimie Ancienne," 1889, p. 40.

† "Geology of the Quicksilver Deposits of the Pacific Slope, 1888"; also in "Mineral Resources of the U.S., 1892," pp. 139-162.

* "Annual Report," Department of Mines and Agriculture N.S.W. 1891, p. 237.

that when heated to redness with silica it forms a readily fusible silicate, a circumstance taken advantage of by the potter and brickmaker. It is extensively employed as a glaze on stone-ware and similar goods, though unless judiciously applied, is apt to do the work very ineffectively, so much so that "salt glazes" are not always regarded in a favourable light. Salt forms fusible compounds with antimony and arsenic, and is thus in great request by the metallurgist. Soda, or sodium carbonate, possesses the property, amongst other things, of oxidising many metals, such as tin, zinc, iron, &c.; it forms fusible compounds with silica and several metallic oxides. Both soda and salt are much used in glass-making. *Glauber's salt*, or mirabilite, may perhaps be mentioned here; its principal employment for us is in connexion with testing the durability of building stones, as in Brard's method, though that has more interest from the historical point of view than as a method extensively adopted at the present time. It is hydrous sulphate of soda; when exposed to the air it becomes anhydrous and falls to powder; commonly, also, it occurs as a white or yellowish efflorescence.

With reference to the metal sodium, it is soft, silver-coloured, and possesses a strong affinity for oxygen. It was discovered by Sir H. Davy, by exposing a piece of moistened hydrate of soda to the action of a powerful voltaic battery, the alkali being placed between a pair of platinum plates connected with the battery. Sodium is so soft at ordinary temperatures that it may be easily cut with a knife or pressed between the finger and thumb. When placed upon the surface of cold water it decomposes that fluid with violence, but does not ignite the hydrogen which is liberated unless the motion of the sodium be restrained, when the cooling effect is much less. When a few drops of water are added to sodium the hydrogen liberated immediately flares up, and such is also the case if it be put on hot water. It burns with a yellow flame. The last-mentioned properties have received a striking illustration during the past year in connexion with explosions in street boxes, as recently reported on by experts engaged by the Board of Trade.

Common salt is derived from two principal sources; (1) the sea, from which it is obtained by evaporation, and (2) rock-salt which occurs in stratified deposits in various parts of the world. In Great Britain enormous quantities are raised; most of it is produced from brine, especially in Cheshire, and also in Durham, Lancashire, Staffordshire, Worcestershire, and Yorkshire. Rock-salt is worked in the first-mentioned county and in Antrim, but the quantity so obtained is only one-tenth of the total output. In some cases the brine flows through pipes to the alkali works, and is converted directly into soda. From the manner in which rock-salt occurs in this country it is tolerably certain that it was laid down in inland seas or salt lakes, somewhat like the deposits now taking place in the Great Salt Lake, Utah, the Caspian Sea, and elsewhere. It is found in rocks of early Secondary age (chiefly the Trias). The following section (fig. 8) refers to a boring in the Durham salt district at Middlesbrough, where, it will be noticed, the salt-rock is 100 ft. in thickness, and is situated 1,206 ft. from the surface of the ground. Salt is a mineral of almost world-wide distribution.

POTASSIUM.

This possesses but little interest for us. Like sodium, it is a soft metal resembling silver in appearance, and eagerly absorbs oxygen on exposure to the air; when placed in water it likewise burns fiercely. Its principal ore is *carnallite*, a massive and granular mineral which is strongly phosphorescent. Chemically, it is hydrous chloride of potassium and magnesium, with about 26 per cent. of chloride of potassium. It is found in large quantities at Stassfurt in Saxony, associated with rock-salt. *Nitre*, saltpetre, or nitrate of potash, is another ore of almost world-wide distribution; it is used in the manufacture of gunpowder, being such a powerful oxidiser it is in great request by metallurgists. In addition to being obtained from ores, potash is derived from the ashes of trees and land plants in general, where large forests occur, as in the United States, Canada, Russia, Sweden, Germany, Tuscany, and France. The process of extraction consists, briefly, in incineration, the resulting ashes being chiefly carbonates, chlorides, sulphates, phosphates, and silicates of potassium, sodium, calcium, magnesium, and iron; carbonates generally constitute by far the larger proportion of the ash, which is treated with water to dissolve out the soluble constituents. *Potassium carbonate*, derived also from the rock at Stassfurt and from sea-water in enormous quantities, is used in the manufacture of crystal glass. *Potassium nitrate* is also employed in making glass; this salt occurs, together with other nitrates, as an efflorescence on the soil in various hot countries. In India it is regularly and systematically collected,

Fig. 8.

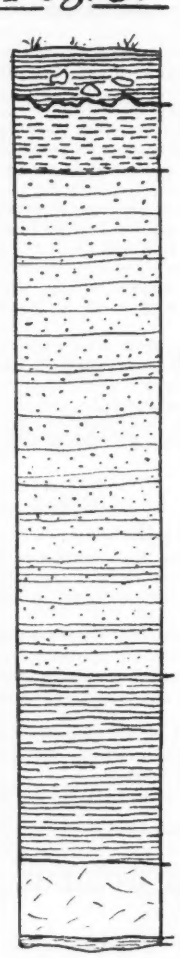

Alluvium and boulder clay, 70 ft.
Red marls, with gypsum and sandstone, 89 ft.
Red sandstones, with marls and gypsum, 802 ft.
Red marls with gypsum and salt, 245 ft.
Rock-salt, 100 ft.
Gypsum and marls, 7 ft. 4 in.

FIG. 8.—*Section of Boring, Durham Salt District, at Middlesbrough.*

and after approximate purification is exported in large quantity. *Yellow prussiate of potash* is used in making Berlin blue.

AMMONIUM.

The existence of this metal has not yet been fully demonstrated, though from the characteristic behaviour of its compounds there is little doubt but that it should be regarded also in a separate category by inference. All the ammoniacal salts are more or less soluble, and are easily and completely volatilised before the blowpipe, which latter circumstance alone is sufficient to distinguish them from other salts. The compound in which we are principally interested is the chloride, or *sal-ammoniac*, a mineral generally existing as an efflorescence or incrustation, though it occurs also in the crystalline form. It is found commonly in volcanic districts, as at Etna, Vesuvius, Stromboli, and Hecla; also in the neighbourhood of ignited beds of coal, and in sea, and certain mineral waters. In this country it has been discovered at Newcastle-on-Tyne, near Paisley, and Bradley in Staffordshire. Mr. Rutley states that it is prepared artificially from bones and other organic matter, also from the liquor condensed from gas-works and from soot. Sal-ammoniac is used in various metallurgical operations. Copper is tinned by the aid of this substance;* this is accomplished by the copper surface having first been made smooth by rubbing it with sandstone, after which it is made hot and powdered sal-ammoniac is applied. This latter has the property of removing the oxide from the surface and leaving the copper perfectly bright. A little tin is now placed upon the copper together with some powdered rosin. The plate is again heated, and when the tin melts it is spread over the surface to which it firmly adheres. The tin employed for this purpose is sometimes alloyed with lead. Sal-ammoniac is also extensively used in soldering.

* Consult Bloxam & Huntington, "Metals," 1894, p. 268.

OBITUARY.

MR. JOHN COLSON.—We regret to announce the death of Mr. John Colson, F.R.I.B.A., senior member of the firm of John Colson & Sons, architects, of Winchester, which took place at his residence, Beechwood, Worthy-road, on the 21st inst., in his seventy-sixth year. Mr. Colson, although not a native of Winchester, lived the greater part of his life in the city. The son of Mr. John Colson, of Hall Court, Shedfield, he served his articles with the late Mr. Owen Carter, of Winchester, and had as his fellow pupil the late George Edmund Street, R.A. He afterwards proceeded to London, and subsequently he entered into a partnership at Norwich, which did not prove a success. Returning to Winchester, he started in business on his own account, since which he has carried out many works, for the most part of an ecclesiastical nature, including the building or restoration of over 120 churches, among them new churches at Awbridge, Herriard, Fair Oak, Morestead, Ovington, Portsdown, Ramsdale, Sholing, Shalden, Stockbridge, Swanmore, Soberton, Bradley, Shedfield, Lockerley, St. Paul's (Wyke), and Hedge End, and extensive alterations and additions at Highfield (Southampton), Micheldever, &c. Amongst other works carried out by the deceased were the Diocesan Training College, Bishop Morley's College, and additions at Hoddington House for the late Lord Basing, besides many schools. He was appointed architect to the Dean and Chapter in 1855, and among the more important works carried out by him upon the Cathedral fabric were the restoration of the west front over thirty years ago, and of the roof of the south transept. He was in 1858 elected a Fellow of the Royal Institute of British Architects. He served on the Winchester Town Council for a short period. Mr. Colson was of a quiet, retiring, yet genial disposition, taking little part in public affairs, his leisure during the late years of his life being spent in scientific and horticultural pursuits. The deceased leaves a family of two sons and three daughters. Mr. John B. Colson, who has been associated for some years with his father, will, we understand, carry on the business. The funeral took place at Shedfield, on Saturday last. The following interesting particulars we take from the letter of a gentleman who knew Mr. Colson well:—"He was working at the office only a few hours before his death, in the room where, accumulating curious furniture and beautiful pictures, he had worked for years. He was active and lithe to the last, and three years ago when walking on the east end roof of the cathedral he amused me by imitating the gait of a former bishop who would not be assured that one can't slip on lead. Apropos of his Norwich partnership he told me (in sympathy here) that it had brought him a brass inkstand for a thousand pounds. Mr. Colson was a man of genius, in everything inventive and masterly, very definite in his likes and dislikes, full of kindness and wit, and always ready for a joke, but some people never found this out, and to them he was cold and distant. He had a grand head and fine features, and a tall upright figure. One of his pupils was J. K. Colling, whose beautiful details of 'Gothic Ornament' he used to give his later pupils to work on. He was a great admirer of Ruskin, and on returning a book ('The Elements of Drawing') to me, remarked that 'he always had to go right through in reading *him*.' From the moment of meeting, when he was kind and encouraging, and all through the time after and to come, I had, have, and shall have the deepest affection and gratitude for his kind and sympathetic teaching and friendship."

GENERAL BUILDING NEWS.

INFIRMARY, KING'S NORTON, WARWICK.—The foundation-stone of a new infirmary for the King's Norton Union was laid on the 21st inst. The building when complete will contain an administrative block in the centre, with medical officer's, matron's, store-rooms, &c. This block is large enough to enable the officials to deal with an additional 250 patients, which, with the present provision will give accommodation for 500. On either side of the block will run corridors, to which will be connected with the nurses' rooms, bath-rooms, &c., with lavatories at the end, connected with short lobbies. Emergency staircases will be provided in each ward, and hydrants will be placed in all wards in case of fire. The wards are so arranged that the air has free circulation, and they are so situated that they receive the full benefit of the sun, both from the east and the west. At the rear of the administrative block will be the cooking kitchens, nurses' and servants' living-rooms, culinary stores, wash-houses, &c., and all will be sufficiently large in case of future extension of the infirmary. Special attention has been given to the sanitary arrangements, and the building is being constructed with a view to making it fire-proof. The infirmary, including furniture, is estimated to cost about 23,000*l*. Mr. D. Arkell, of Birmingham, is the architect, Mr. T. Rowbotham being the builder.

BATHS, LEEDS.—The new baths erected by the Leeds Corporation in Union-street were opened on the 24th inst. by Mr. Henry, Chairman of the Baths Committee. The building is situated in the midst of a densely-populated neighbourhood, upon the site

of the old "midden." In construction and design the baths are almost a replica of those recently provided by the Corporation in Kirkstall-road, the architect being the same—Mr. Hanstock, of Batley. The interior fittings are practically identical. The water area in the first-class bath is 60 ft. by 24 ft., and in the second-class bath 75 ft. by 30 ft. There are in the first-class room marble-lined dressing-boxes on one side of the bath, and in the second-class the open boxes, slate-lined, all round, forming a kind of arcade, which supports a gallery, for the convenience of spectators. Mr. Ainsley was clerk of the works.

EPISCOPAL CHURCH, INSCH (N. B.), — St. Drostan's Church, Insch, was consecrated on the 24th inst. The church was designed and carried out by Messrs. Ross & M'Beth, architects, Inverness.

SCHOOL, LANCASTER.—The first school erected by the Lancaster School Board was opened by the Chairman (the Mayor) on the 17th inst. This comprises the infants' portion only for upwards of 300 children. The entire school, when completed, will give accommodation for 1,000 children. The school has been built by local contractors from the designs and under the superintendence of Mr. Robert Walker, architect, Windermere, and Church-street, Lancaster, whose plans were selected in public competition.

CATHOLIC CHURCH, HULL.—The foundation-stone of St. Wilfrid's Catholic Church, which is being erected on the Boulevard, Hessle-road, Hull, will be laid to-day (Saturday). It will consist of nave, 76 ft. long by 22 ft. wide, with north and south aisles, 10 ft. 6 in. wide. At the end of each aisle is an octagonal ended side chapel, 22 ft. long by 14 ft. 6 in. wide, the roof of which will be groined. One chapel is to be dedicated to the Blessed Virgin and the other to the Sacred Heart. The aisles will be lighted by ten three-light traceried windows, the clearstory of the nave by the same number, but rather less in size. The sanctuary will have four two-light traceried windows, whilst the roof over the sacrarium will be groined in such a manner as will suit colour decoration in the future. The nave is divided on either side from the aisles by arcades of five bays, with moulded arches resting on clusters of polished red granite shafts, with moulded bases and carved capitals. The choir gallery is at the west end, above the main entrances, with an organ-chamber and belfry at the side. There is a large working sacristy, with heating vault below, from which it is proposed to warm the church with piping on the high-pressure system. The accommodation provides for about 600 adults, and the contract for the building has been let to Messrs. Colley & Levitt for the sum of 2,895*l.* The church has been designed by and will be carried out under the superintendence of Messrs. Smith, Brodrick, & Lowther, architects, of Hull.

FLATS, DUBLIN.—There is now being erected in Earlsfort-terrace, Dublin, a large pile of buildings, which are designed for residences in flats. The building has six stories and a basement. It has a frontage of 74 ft., with a depth of 70 ft. The height to the gables is 100 ft. The different flats may be reached either through a grand staircase or by means of lifts. The floors are of fire-proof materials. The hall-door gives entrance to a hall whence the different apartments may be reached. Each flat is provided with a tiled kitchen with coal "cellar," &c., and a shoot for carrying off the dust at the back. At the back of the building is a servants' closet and the servants' bedrooms. There is a large area in the centre of the building open to the sky, the walls being lined throughout with white enamelled tiles. At the front are a drawing-room and dining-rooms with sliding doors by means of which the three apartments may be combined in one for at-homes, dances, or other festivities. There are bath-rooms, both hot and cold, on every flat. The building is being executed from the designs of Mr. Hudson, C.E., of Dublin, and the work is carried out under the directions of Mr. T. Fitzpatrick.

CHURCH, ILKESTON.—The foundation-stone of a new church at Ilkeston was laid recently. The building, when completed, is intended to replace the temporary church at Hallam Fields, erected by the Stanton Ironworks Company. The same company are building the permanent church immediately to the west of the present one. Mr. Percy Curry, of Derby, is the architect, and the church will be a red brick structure, with stone dressings, capable of seating 450 people. It is designed in the Decorated style. The contractor is Mr. W. V. Ireson, of Ilkeston.

CATHOLIC CHURCH, FERBANE, IRELAND. — A new Catholic church is being erected at Ferbane from the plans of Mr. William Hague, architect, Dublin. The church will consist of nave, transepts, and chancel, and will be 110 ft. long from the main entrance to the great chancel window, 31 ft. wide at the nave, 16 ft. at the chancel, and 22 ft. at the transepts. It will contain two sacristies, and a belfry tower at the western front 100 ft. high. The nave will contain five tracery windows on each side, and the transepts two windows. There will be a chancel window 20 ft. high and 14 ft. wide. The belfry will be furnished with a winding stair as far as the organ-loft. The chancel is to have tracery side-light windows. The elevation of the roof will be 24 ft. from wall plate. Mr. P. Glennon, of Dublin, is the clerk of works.

MEMORIAL HALL, UPPER HEELEY, YORKSHIRE.—On the 26th inst. the memorial-stone of a new building, to be called the "Henry Adams Memorial Hall," was laid at Upper Heeley. Mr. W. J. Taylor is the architect. The new building will contain a hall capable of accommodating 250 people, and there will be four class-rooms.

POLICE-STATION, SOUTH MOLTON, DEVONSHIRE.—A new police-station has just been erected at South Molton. The building has a frontage of about 60 ft., and is three stories high. Messrs. Stevens & Son, of Exeter, are the contractors, the cost being about 2 300*l.* Messrs. Garton & King, also of Exeter, supplied the hot-water apparatus for the cells. Mr. E. H. Harbottle is the architect, and Mr. Bevis clerk of the works.

PROPOSED ISOLATION HOSPITAL, HINCKLEY, LEICESTER —On the 23rd inst., Dr. R. Deane Sweeting, Local Government Board Inspector, conducted an inquiry at the Town Hall, Hinckley, into an application for a loan of 4,000*l.* for the purchase of land and erection of permanent buildings to be used as an infectious hospital by the Hinckley Urban and Rural District Councils. Messrs. Simpson & Harvey, of Leicester, are the architects.

NEW CONVALESCENT HOME, GRANGE-OVER-SANDS.—Tenders for this work were opened at a meeting of the Executive Committee of the North-Eastern Counties' Friendly Societies, previous to a meeting of the General Committee of that body, in the Oddfellows' Hall, West Hartlepool, on the 24th inst. The latter resolved to adjourn the consideration of the work for the new home to that day five weeks. The lowest tenders amount to 4,055*l.*; the highest to 7,313*l.* The architect is Mr. W. T. Aggutter; the quantity surveyor, Mr. H. T. Neilson, both of Darlington.

POLICE-OFFICE, GLASGOW. — The Glasgow Watching and Lighting Committee of the Town Council inspected the new Southern Police Buildings on the 27th inst. The building is situated at the corner of Oxford-street and Nicholson-street. It occupies an area of ground extending to 2,390 square yards; the site cost 12,000*l.*, and the contracts for the erection of the building amount to 26,000*l.* There are the usual requirements of the Police Department—court hall, magistrates' room, muster hall, witnesses' room, fifty-five cells, to accommodate 150 prisoners, instead of seventy as formerly. Within the buildings there is also barrack accommodation for forty-five constables, with kitchen, mess-room, and reading-room. The Lighting Department will also find accommodation in the new building. There is accommodation provided for the collector of assessments for the south side of the river, and for the registration of births, deaths, and marriages. The plans were prepared by Mr. A. B. M'Donald, City Engineer. Mr. Gray was clerk of works.

NEW WING, DEVON AND EXETER HOSPITAL.—Mr. A. O. Sillifant laid the foundation-stone on the 27th inst. of a new wing which is being erected at the Devon and Exeter Hospital. The architect is Mr. Charles Cole. The length of the new wing, including the sanitary towers, will be about 140 ft., and from the ground to the ridge the height averages 60 ft. The main walls will be of brickwork 18 in. in thickness throughout, and the roofs are to be covered with special slates. The wing will be three stories high, and consist of three main wards, each containing 24 beds, and three small single bed wards. The main wards are to be 97 ft. long and 26 ft. 6 in. wide. The floors are to be formed of steel joists with concrete and terra-cotta lintels on which will be laid teak floor boards. At the further end of the wing will be a balcony to each floor and a fire escape staircase. The space underneath the wards will form a covered airing ground. Each floor has a linen-room, kitchen, pantry, &c., and in the towers are bath-rooms, lavatories, &c., and the walls of which are to be lined with white-glazed bricks inside. A lift will be provided running from the basement to the top floor for patients and dinner-wagons. The present wooden staircase will be removed, and one of iron and concrete constructed in its place, connecting the main building with the wing. In excavating for the foundations, in addition to the old cellars found, several deep pits had to be sunk, as it was discovered that the lower end was honeycombed by old brick barrel drains. The building contract is being carried out by Messrs. Tree & Bolley.

PRESBYTERIAN CHAPEL, NEWPORT, MON.—The foundation-stone of a new Presbyterian Chapel was laid on the 27th inst. by Lord Tredegar, in Caerleon-road, Newport. The style of the building is Early English. It is to be built entirely of stone, the front being of finished stone shoddies, and the dressings of Bath stone. The tracery window to Caerleon-road is the main light. Provision has been made for an extension of the structure when the necessity arises. The dimensions of the present building will be:—Length, 64 ft.; width, 40 ft.; and height from floor to ceiling, 50 ft. The roof is of open timber, and a gallery is to be erected at one end, capable of extension round two other sides. The seating accommodation will be for about 470. The work is being carried out by Messrs. A. S. Morgan & Co., from designs by Messrs. Graham, Hitchcox, & Co.

Y.M.C.A. BUILDINGS, BELFAST.—The foundation-stones of the new buildings which are to be erected in Wellington-place for the City of Belfast Young Men's Christian Association were laid on the 27th inst. The block of buildings comprises a frontage of 86 ft. to Wellington-place, and a depth of above 230 ft. A modified Gothic has been chosen as the style of the new edifice, and it will be executed in Belfast red Annadale brick facing, with Dumfries sandstone used sparingly in the string-courses, battlements, and copings. A special feature is made of the ground-floor frontage, which is carried out in polished red Shap granite columns and pilasters supporting cut-stone arches and blockings at both entrances on each side of the main doorway. Above the doorway rises an octagonal tower, which is broached into a circular one at the level of the main cornice, and terminates in a blocking, with battlements, at a height of 100 ft. The sky-line is further broken up by three gables, the highest of which has a weather copper vane at an elevation of more than 100 ft. from the pavement. Between the gables are placed octagonal turrets, corbelled out and finishing with conical copper high-pitched roofs. The windows on the first and second floor are formed into oriels which terminate in battlemented copings and flat lead roofs, to which access is obtained from the large circular-headed windows of the third floor. The main entrance corridor is 10 ft. wide, and extends from Wellington-place, a distance of 170 ft., to the great hall, 82 ft. by 60 ft., with galleries round three sides, having its front towards Wellington-street, and accommodating 1,300 persons; two large emergency doors, 6 ft. wide, are placed, opening on this street. Half way down the main corridor is the entrance to the gymnasium, 90 ft. by 50 ft., with a narrow gallery extending right round it. Another entrance is also afforded direct from Wellington-place, which also gives access to a staircase to the several suites of offices to let, which will be alternately added to the rooms required by the Association. The gymnasium will be fitted up with a special running track round its four sides, and have a fully-equipped set of baths, lavatories, and instructors' room. The offices of the association are situated between the main corridor and the gymnasium, and adjacent to the main staircase. A special feature of the ground-floor plan is the café, about 40 ft. by 30 ft., placed beside the main entrance, and having a large ladies'-room behind it. The remainder of the frontage is taken up with two shops and the entrance to the gymnasium. On the first floor is placed the reading-room, above 40 ft. square. The minor hall, 74 ft. by 30 ft., is situated at one side of the upper portion of the gymnasium, comprising gallery and dressing-rooms. The second floor has two parlours, with similar offices to let, as on the third and fourth floors. The third floor contains a number of apartments for class-rooms, kitchens, and other purposes, whilst under the roof is planned a photographic gallery. The whole contract will be carried out by Messrs. William M'Cammond & Son. The plumbing will be done by Mr. J. Dowling, King-street, and the architects are Messrs. Young & Mackenzie.

RESTORATION OF DAWLISH PARISH CHURCH.—The second section of the restoration of Dawlish parish church will probably soon be proceeded with. The architect is Mr. S. Dobell. The first portion of the restoration was carried out under the direction of Mr. Piers St. Aubyn, the cost of which was between 7,000*l.* and 8,000*l.*, exclusive of the chancel window and reredos. Several new stained windows have since been placed in the church.

SANITARY AND ENGINEERING NEWS.

SEWAGE SCHEME, BOWNESS.—Mr. G. W. Willcocks, one of the inspectors of the Local Government Board, has just held an inquiry at the Institute, Bowness, in connexion with an application by the District Council for leave to borrow the sum of 4,000*l.* for the purpose of sewage disposal, the scheme adopted by the Urban District Council being that known as the International process. Mr. G. Gatey, the Clerk to the Council, stated that the normal population of Bowness was 2,062, and the maximum summer population 4,500. It will be remembered that the Bowness District Council figured some time ago at the Appleby Assizes, the result of that trial being that a limited time was allowed for the carrying out of a purification works. The Council having visited and inspected many schemes, finally decided upon the International process as being best adapted for their district, Messrs. Lomax & Lomax, civil engineers, Manchester, being engaged to carry out the scheme.

HERMITE SANITATION, NETLEY HOSPITAL.—The War Office have instructed Messrs. Paterson & Cooper, engineers, of London, to proceed with the erection, at Netley Hospital, of the Hermite Sanitation plant, the cost of which has been provided for in this year's Parliamentary estimates. The Corporation of Cape Town have also ordered a plant for producing electrolised sea-water, with a view to the Hermite process being applied to the sanitation of Cape Town.

WATER SUPPLY, GRETTON, GLOUCESTER.—The Rural District Council of Winchcomb (Gloucester) have called in Mr. J. E. Willcox, C.E., of Birmingham, to report and advise on schemes of water-supply for the villages of Gretton and Guiting Power.

WATER SUPPLY SCHEMES, STRATFORD-ON-AVON DISTRICT.—The Stratford-on-Avon Rural District Council have instructed Mr. J. E. Willcox, C.E., of

Birmingham, to submit schemes of water-supply for the parishes of Alveston, Tiddington, and Moreton Morrell, within their district. The Council have also decided that the whole of the house drainage works in connexion with the new sewerage scheme of Henley-in-Arden shall be carried out by the contractor to the works, Mr. Griffin, of Henley-in-Arden, under the supervision of the engineer, Mr. Willcox.

Water Supply, Lostwithiel, Cornwall.—The completion of a scheme for a new water supply at Lostwithiel has just been celebrated. Messrs. S. W. Jenkin & Son, of Liskeard, devised the scheme, which provides for the collection of the water from three springs into a reservoir, the capacity of which is 40,000 gallons. The water is conveyed by a natural fall through a 4-in. main, and enters the town at the corner of the "Talbot Hotel." The reservoir is 200 ft. above the highest part of the town, 300 ft. higher than the point at which the water first enters the borough; and 350 ft. above the lowest part of the town. The contractors were Messrs. Oliver & Minnear, of St. Blazey.

The Snaefell Electric Railway, Isle of Man.—This railway was opened on the 21st inst. The new station occupies a site in the centre of Laxey, near to the lead-mining works. One of the principal difficulties which the promoters have had to face has been a gradient of one in twelve. The engineer, Mr. Fell, C.E., devised a system which provides for the laying of a central rail along the track. This rail is somewhat higher than the bearing rail, and heavier. By this means, not only do the cars run more steadily, but absolute safety of descent is assured by means of a gripper-brake upon this central rail, in addition to an ordinary brake upon each of the eight wheels of the car. The cars are comfortable structures, giving seats for forty-eight passengers, are entered at the ends, and run upon eight wheels. The generating plant consists of four Lancashire boilers of 150 h.-p. each, and five horizontal compound engines of over 100 h.-p. each. These drive five kilowatt dynamos. They are of the Mather and Platt type, with Edison-Hopkinson magnets, and "Manchester" armatures. The ascent of 4¾ miles is made in half-an-hour, and the descent in less time.

Glossop Sewage Scheme.—Mr. J. W. B. Clarke, M.Inst.C.E., conducted a Local Government Board inquiry at the Town Hall, Glossop, on Tuesday last respecting the application made by the Glossop Corporation for sanction to borrow 44,000*l.* for works of sewerage and sewage disposal. The scheme submitted for the consideration of the Local Government Board includes the sewering of the entire borough, and also the carrying out of outfall purification works. The scheme has been prepared by Messrs. Lomax & Lomax, civil engineers, Manchester, and is calculated to deal with the sewage from a population of 30,000. The precipitation tanks will be on the continuous upward flow principle, the effluent therefrom being passed through polarite filter-beds. The application was opposed by Mr. Fox on behalf of Messrs. Potter & Co., of Dinting Vale Print-works, the contention of Mr. Fox being that the whole of the dye and bleach waste water should be admitted into the Glossop sewerage system. The Corporation having refused to deal with this waste water on the grounds that it would injuriously affect the treatment of the sewage at the outfall works, Mr. Fox gave notice that if in carrying out the scheme the Glossop Corporation omitted to provide facilities for the reception of this waste water into their sewers, Messrs. Potter would then at once apply for a mandamus to compel the Glossop Corporation to do so.

FOREIGN AND COLONIAL.

France.—M. Ernest Barrias, the sculptor, has just completed the monument to Emile Augier, to be erected in the Place de l'Odéon, by public subscription. The monument will probably be erected in October.——The monument to the memory of President Carnot, at Fontainebleau, is to be inaugurated. M. Peynot is the sculptor.——A "royalist" committee has erected, opposite the celebrated church of Sainte Anne d'Auray, a monument to the memory of the Comte de Chambord. The monument, which is just completed, includes a large pedestal ornamented with four statues, representing Jeanne d'Arc, Bayard, Duguesclin, and Sainte Geneviève; above this is the kneeling statue of the Prince, looking towards Sainte Anne d'Auray.——The fine statue of Henri de la Rochejacquelein, by M. Falguière, an illustration of which was published in the *Builder* in July last, is to be erected at Bambigné (Deux Sèvres), towards the end of next month.——Two painters, MM. Castellani and Victor Meunier, have applied to the organising committee of the 1900 Exhibition for space for an immense panorama in which they intend to represent the depths of the sea ("abîmes sous-marins").——The death is announced of M. Ch. E. Bailly, the sculptor, author of the statue of the Abbé Grégoire which was erected some years ago at Luneville.——The works of restoration at the Château of St. Germain-en-Laye, suspended for a good while back, have now been resumed under the direction of the department of "Monuments Historiques," and it is expected that the reconstruction of the chapel and of the adjoining turret will be completed shortly.——A steel bridge is to be constructed over the Seine at Melun, for the passage of the new line of railway from Corbeil to Montereau. It will be carried on four stone piers.

Germany.—The twenty-fifth anniversaries of the principal events in the Franco-German war have given occasion for the erection of a large number of monuments throughout Germany. In many instances we hear of new memorials to the Emperor William, and the great statesmen of his time, or of monuments to generals, and officers, or privates of certain regiments. The memorials are of a most varied form, from the elaborate equestrian statues of the larger towns to the plain memorial fountains, tablets, &c., of the smaller communities.——The Royal Botanical Gardens at Berlin will now be definitely transferred to a suburb. The present grounds in the Potsdamer-street are to be sold for building purposes, but there is a movement to retain this space as pleasure-gardens. In London voluntary subscribers would be easily found to retain this popular site, but at Berlin the Municipality are expected to find the money.——The North Sea-Baltic Canal will be kept open for the usual traffic during the winter months, but the passage rates will be raised 25 per cent. on account of the extra expenditure this occasions.——The Dortmund-Ems Canal, which will be an important part of the proposed Central German Canal system, is making rapid progress. About 9,000,000 cubic yards of soil have already been moved, and 1,500,000*l.* spent. The estimated cost of the canal is 3,500,000*l.* No progress has, however, been made with the Rhine Dortmund Canal, which will also form a part of the system.——Messrs. Siemens & Halske have now prepared further plans for a second electric railroad, which will serve as an "outer circle" line in connexion with the Metropolitan Railway, for which they have already obtained the necessary concessions from the authorities.——At Stuttgart, a competition has lately been decided for the new Town Hall. The jury did not give the first premium, but there were three second premiums of 250*l.* each, two third premiums of 150*l.* each, two fourth of 100*l.* each, and a number of minor ones (50*l.* each). Messrs. Reher & Kauffmann (Frankfort), Messrs. Kuder & Müller (Strasburg), and Messrs. Volmer & Jassoy (Berlin) won the three 250*l.* premiums. This is the second competition for a large Town Hall during the last twelve months, and the sites and conditions were very similar. There were 202 competitors. The site was practically 200 ft. square. Of other competitions at Stuttgart, we would notice one for laying-out the historical Friedrichsplatz, on which a substantial sum is to be spent.——Dessau and Jauer are to have a new Town Hall, and a competition has been opened for the design.——A competition for a Town Hall at Hanover has also been opened, and 1,800*l.* is to be given in premiums. The first premium will be 600*l.* and the second 400*l.*, so that a large number of designs are expected. A very influential committee will act as assessors.——A competition has been opened for the plans for the exhibition grounds at Kiel. This exhibition, though an industrial one, will be of special interest to naval men, as the shipbuilders of Europe will be well represented.

Saxony.—Dresden is to have a Bismarck monument, costing 5,000*l.*, and a competition has been opened for the design. Premiums of 200*l.*, 150*l.*, 100*l.*, and 50*l.* respectively will be given.——Professor Wallot, who holds the Architectural Chair of the Saxon Royal Academy, has now practically definitely settled at Dresden, and only visits Berlin to attend to the completion of the new Houses of Parliament. His next commission will probably be from the Saxon Government, for a new home for the Diet of the Kingdom of Saxony. The designs Professor Wallot has prepared show some interesting planning, and the rendering of the façades is in keeping with the surroundings of the site, which is on the historical Bruehlsche Terrace. One of the halls in the old building is to be retained in the new block, and this causes some difficulty. There will be an Art Exhibition at Dresden next month, and a large International Art Show is being arranged for the summer of 1897.——The extensive works of altering the number of lines of railway which pass through Dresden, and making an extensive central station, are now well in hand, and one of the halls of the new station and some of the administrative blocks are nearly ready. The works are being carried out under very difficult conditions, as the through traffic has to be carried on as usual.——The competition for the design of the Saxon Industrial Exhibition, which will be held at Leipzig, has been won by Herr Tscharmann.——The historical castle "Pleissenburg," which is situated in one of the busiest parts of Leipzig, will now have to be pulled down to make room for a new town hall and block of tenements. The old castle turret will alone remain, and is to be used as a central feature for the the Town Hall. A competition is being held for schemes showing the arrangement of the site.——Dresden is following the Berlin example by opening a competition for the designs of new lamp-posts on the market place. Some substantial premiums will be given, including three of 100*l.* each.

MISCELLANEOUS.

Award of Evening Exhibitions in Science and Technology.—From the *London Technical Education Gazette* (the official Circular of the Technical Education Board of the London County Council), for August, we take the following:—"The following list gives particulars of the candidates to whom Evening Exhibitions of 5*l.* per annum for Science and Technology have recently been awarded. The Exhibitions are awarded in the first instance for one year, but are renewable for a second year at the option of the Board. The exhibitioners are required to attend evening classes in science or technology in institutions approved by the Board, and the Exhibition is intended to cover the class fees and expenses incidental to attendance. For this examination 256 candidates sent in their names, and 223 presented themselves. . . . The examination on the first evening consisted of an easy arithmetic paper occupying two hours, followed by an hour's English composition, the paper set affording opportunity for every candidate to write on some subject with which he or she was familiar. The second evening was devoted to drawing, the candidate being required to make freehand sketches from memory of a few very familiar objects, while the latter part of the paper was devoted to very easy geometrical and constructional drawing. On the third evening papers were set in the several special subjects selected by the candidates, and comprised: Chemistry, mechanical engineering, mechanics, mathematics, general physics, electricity and electrical engineering, practical geometry, machine construction, building construction, steam, botany, physiology, biology, hygiene, navigation, plumbing, metal-plate work. Of the candidates forty-six submitted drawings and twenty submitted specimens of practical work in addition to sitting for the examination. Of these candidates twenty-two were adjudged worthy of exhibitions on the merits of the works submitted, but nine of these also won exhibitions on the results of the examination. In the few cases in which fairly good drawings were submitted by candidates who entirely failed in drawing in the examination no credit was given for the submitted works. The papers sent up by the candidates in the examination differed very widely indeed in merit, as did the submitted works. In many cases practical men showed their knowledge in the sketches they sent up in answer to the questions on building construction and machine construction. These papers and the paper on practical geometry were, as a rule, answered far better than most of the other papers, but it was apparent that a very large number of the candidates who selected distinctly technical subjects had derived their knowledge wholly from attending classes, and had no practical acquaintance with the trades concerned, while it was still more apparent that a very large number of the candidates had attempted to build a superstructure of technology on a very poor foundation of arithmetic and mechanics. In arithmetic thirty candidates obtained less than 20 per cent. of the total marks, and eighty obtained less than 30 per cent. On the other hand, in the whole examination, out of a maximum of 900 marks, two candidates from the People's Palace obtained 757 and 744 marks respectively, while a candidate from Regent-street Polytechnic obtained 715 marks, and another from the same Polytechnic obtained full marks in electricity. An interesting example of learning in class only was afforded by one candidate, who made a drawing of a tusk tenon for a trimmer upside down. Of the seventy-seven candidates fifty-six have been trained in London Polytechnics, including under that title the Birkbeck Institution and the City of London College, which form parts of the City Polytechnic, and eleven have been students in Evening Continuation Schools, leaving only ten who have come from other institutions or have relied on private study."

Drinking Fountain, Newcastle.—The water has been turned on to the Laing Drinking Fountain, which has been erected to the memory of the late Mr. W. Laing, directly opposite the Blue House and the top of Matthew Bank, but what is now known as Pandon Dene-road. The fountain is of Peterhead granite, the greater portion of it being polished. It consists of a round column several feet in height, on the top of which is a large spherical stone of the same material, the whole being surmounted by a metal shaft of floral design. Besides the usual arrangement for supplying water to wayfarers, there is a drinking-trough for cattle, and a smaller one for dogs. The sculptor was Mr. R. Beall, Newcastle.

Sewage Disposal in France.—The subject of sewage disposal is now receiving some attention in France. Last year at the Boulogne Exhibition M. Howatson showed a small installation of the Ferozone-Polarite system of sewage treatment. Two Commissioners, MM. Genis and Rebouffel, were appointed to visit England to see the process in question in operation, and also other processes of sewage treatment. In the course of their visit, amongst other places, they inspected Royton, Hyde, and Huddersfield. They also visited Manchester, Salford, Sheffield, and Lincoln. As a sequel to the demonstration at Boulogne and the report of the engineers who acted as Commissioners, the Municipal Council of Rouen, by a

vote of 22 as against 2, have decided in favour of a scheme, submitted by M. Howatson, C.E., on lines very similar to those adopted at Huddersfield, viz.:—Precipitation by ferozone and filtration through polarite, but before carrying out this scheme it was decided to visit England. In accordance with this decision the Mayor of Rouen (M. Laurent) and a numerous deputation reached England on the 19th inst. and commenced their tour of inspection. In the morning they visited the Royton Sewage Works. During this visit full details of the process were given by the Chairman and by Mr. T. S. McCallum, C.E., Manchester, the engineer of the scheme. After luncheon at the Railway Hotel, Royton, the Mayor's party proceeded to Chorley to inspect the new works designed by the Borough Engineer, Mr. Leigh, C.E., for the treatment of the sewage of Chorley. The Chairman of the Sewage Committee, Mr. Alderman Hibbert, J.P., received the visitors on arrival at the Chorley Station, and thence drove them to the sewage-works, where a close inspection of the various details was made, including a visit to the Chorley Sewage Farm. On the 20th inst. the deputation visited the Wigan Sewage Farm, where they were received by the Mayor and other gentlemen of the Corporation. After a careful inspection of the various parts, they had luncheon with the Mayor and left for Huddersfield, reaching that town on the evening of the 20th. During their stay in Huddersfield they were the guests of the Mayor. The Borough Engineer, Mr. R. S. Dugdale, C.E., met the deputation on Wednesday morning, and conducted them to the Sewage Disposal Works, at Deighton, where they were received by the Chairman and Alderman Walker. In the course of their visit they were able to see a tank fitted with the Candy patent arrangement for the automatic removal of the sludge whilst the tank is working on the continuous flow. Subsequently the delegates were driven to the Town Hall and welcomed by the Mayor of Huddersfield, by whom they were entertained to luncheon along with several members of the Council.

EXHIBITION OF OLD AND MODERN CHINA AND GLASS.—An exhibition of old and modern china, glass, pottery, antique and humorous art, will be opened at the Royal Aquarium on September 10. Amongst the curious exhibits are some monumental vases taken from the Emperor's Palace at Pekin; these were at one time the property of General Gordon. A number of the Nelson relics will also be on view.

CLOCK, THURLES CATHEDRAL, IRELAND.—A large clock has recently been erected in the tower of Thurles Cathedral, Ireland, which chimes the Cambridge quarters, strikes the hours, and has three large dials. It is a gift by Archbishop Croke, and Messrs. John Smith & Sons, Midland Clock Works, Derby, carried out the work.

NEW ENTRANCE TO ORMEAU PARK, BELFAST.—The design for the new entrance to Ormeau Park consists of two pairs of carriage entrance gates, each 14 ft. wide, and two side gates for foot passengers, each 6 ft. wide. The entrance proper measures 64 ft. across, and the total length of frontage to the Ormeau-road, including the wing walls, is about 116 ft. The central feature of the design is a stone pier rising to a height of almost 17 ft., enriched with pilasters set on the angles, having moulded and carved caps and bases, surmounted by a cornice moulded and enriched, terminating with a coronal carried on scroll-work. Each face of the pier has the Belfast Arms carved on a raised panel. The side footway gates are each enclosed in a stone archway, 12 ft. high and 13 ft. 6 in. wide. The side wings have a base and plinth of stonework, with cut-stone piers at intervals, the spaces between the piers being filled up with ironwork panels corresponding in design with the ironwork of the gates. We understand the ironwork has been designed by Messrs. Brawn & Co.'s own artists (Birmingham), whilst they have had the assistance of a local architect, Mr. W. J. Gilliland, Belfast, who has designed for them the general arrangement of the entrance and the stonework.

THE "INVICTA" BRICK-MAKING MACHINE.—On the 22nd inst. a number of people interested in brick-making machinery met at Southall (Middlesex) to inspect a machine practically new to this country—known as the "Invicta"—and to look over recently-erected kilns and plant for turning out bricks by a semi-dry process. The clay used, obtained in a field close by the works, is known as London clay; it contains small quantities of selenite and here and there minute nodules of "race." This is dug, and in wet seasons conveyed to drying sheds, or rather what were described as such; in reality, they were only plots of ground roofed over, and in wet weather would afford but little protection. After a spell of dry weather the clay is dug and sent direct to the mill, being taken from the face of the working up an incline by means of an endless chain actuated by steam-power. The clay when sufficiently treated in the mill passes into the "Invicta" machine and during the process is mixed with a certain quantity of "brick-dust." There it is shaken down, so to speak, and brought under the dies of the machine, when it is subjected to great pressure and the semi-dry brick is ready for burning. The machine has two dies and can thus deliver two bricks at a time. It struck us that it worked very slowly, and some slight improvement is needed to get rid of a sort of rim which necessarily forms all round the edges of the top of the pressed brick in consequence of the dies not fitting exactly into the bed when pressing. At the present time the rim is roughly removed by hand. The unburnt bricks are very hard, and are taken direct from the press to the kiln to be burnt. The admixture of brick-dust was said to assist in the more thorough burning of the brick; for our part we think no improvement in that direction could be effected thereby. But no burnt bricks were available for inspection to enable us to elucidate this point, which was rather an oversight on the part of the management. An enormous improved Hoffmann kiln has been erected, and large machinery shops are being put up close by, so it is evident that the neighbourhood of Southall will become even more noted than at present as a brick-producing centre. The "Invicta" machine is of Australian origin.

SHEFFIELD STREETS.—At a recent meeting of the Sheffield Town Council, a discussion arose on a recommendation of the Highway Committee to the effect that the present rule of requiring paving in every street might be modified to the extent of allowing macadam in suburban roads or streets where the gradient is not steeper than 1 in 25. Where the gradient is steeper, and in all populous districts, they are of opinion that sets should be insisted upon. They also consider that flagging for footpaths should be required in all cases. From the report the City Surveyor presented to the Council in August last, it appears that there were 76·26 miles of undedicated streets in the city, and 215·5 of dedicated streets, a total streetage of 291·61 miles. Several miles of streets previous to 1888 had been accepted by the Corporation with asphalted footpaths and macadamised roads. Extensive repairs on streets constructed in this manner became necessary in a short time after their dedication, and the committee thought that a more durable and better class of construction should be asked for. They considered that when the streets were taken over, they should be constructed in such a manner that it would be a long time before any further expense was thrown on the ratepayers. The initial expense, they thought, should be borne by the property owners. They set about obtaining information from other towns as to the method of construction adopted, and found that in very few of the towns was macadam allowed for streets which were to be taken over as public streets. In nearly all towns also, flagging was insisted on for the footpaths. They, therefore, after consideration, decided that for the health of the inhabitants and in the interests of the ratepayers, a different method of construction should be adopted, and should follow on the lines of other towns. It was found from experience that asphalted footpaths would not be sufficiently durable, and that the macadam of the roads would very soon require repair, and that besides this in steep streets, such as exist in many parts of Sheffield, the surface would become washed off in times of heavy storms and find its way into the sewers, necessitating frequent repairs to the surface of the streets and the expenditure of large sums of money in extracting the road-detritus from the sewer. Property owners were therefore asked to pay a much larger sum per foot frontage of streets than they had previously done. The ratapayers, on the other hand, would have less to pay than in the past by the rates being relieved of the maintenance of these roads for some time to come. The property owners have naturally objected to this change, and they complain of the great cost of the work. This, however, in view of the cost imposed in other towns, is a complaint without much justification, for the price charged in Sheffield compares favourably with the rest. The question appears to be one in which the interests of property owners and those of the public are in danger of clashing. In the past the ratepayers have been called upon to expend money in the repair of defective roads sooner than they should have been. Many look upon this as one of the reasons why the rates are so high. Most experts, and those who have made a study of the question, are of opinion that the streets should be paved (except those in the country) and the footpaths flagged, and that in all cases before the paving is done the sewers should be taken up and examined and relaid, as there are many miles of street that have sewers in them formed of old rubble. Many of these in Sheffield are very dilapidated and very leaky. It is also desirable that causeways should be flagged, because it is much more durable than asphalte. The Sheffield Corporation themselves are asking for 54,000*l.* for the purpose of taking up some of the old macadamised roads and reconstructing them in granite sets. During the last six or seven years, according to statistics recently furnished to the corporation, upwards of six and a-half miles of streets have been taken over, and plans are now in hand dealing with the dedication of six more miles of streets. These six miles represent ninety streets. Many of these are at present unpaved and unflagged, and in an unsanitary condition. In order to enable the subject to be fully discussed and dealt with, the Highway Committee instructed the City Surveyor to obtain particulars respecting private street works. These have been obtained and summarised from a number of other towns. From the statistics given it appears that only in two out of the twenty-two towns is macadam allowed except in special cases, and generally sets are required similar to, or better than those used in Sheffield. It also appears that in nearly every town the causeways are flagged, the exceptions being where either blue bricks or rock asphalt are allowed. Notwithstanding the strong recommendation of the Committee the Council decided to throw it over.—*Sheffield Independent.*

COMPLETION OF BURNS' STATUE, AYR.—On the 21st inst. the last of the four panels at the base of the George A. Lawson statue of Burns was unveiled by Mr. Wallace Bruce, formerly United States Consul at Edinburgh. The statue was unveiled on July 8, 1891, by Sir Archibald Campbell of Blythswood. Since then three panels have been placed on the plinth or die of the monument. These were:—"Tam o' Shanter at the Brig o' Doon," "The Cottar's Saturday Night," and "The Jolly Beggars." The fourth panel is the gift of twenty-five Americans. Dealing with "The Parting of Burns and Highland Mary," the panel is the work of Mr. George E. Bissell, an American sculptor resident in Paris.

MOSAIC PAVING, IPPLEPEN CHURCH, DEVONSHIRE.—Ipplepen Church floor has just been paved with mosaic. The chancel walls have been cleaned and freshly coloured. All has been done under the guidance of Messrs. Tait & Harvey, architects, Exeter, and the work carried out by Messrs. Packer, of Newton Abbot.

SUPPLY OF WINDOW BLINDS TO THE GOVERNMENT.—Messrs. Tidmarsh & Sons, of Islington, have obtained the contract with H.M.'s Government for the supply of window blinds for the next few years.

LEGAL.

ALLEGED BUILDING TRESPASS:

CASE IN THE VACATION COURT.

THE case of Woodhead *v.* McDonough on Tuesday last came before Mr. Justice Mathew sitting as Vacation Judge, it being a motion for an injunction to restrain the defendant from committing an alleged trespass on the plaintiff's premises, in breaking into part of a wall so as to obstruct the plaintiff's flue, and also to restrain the defendant from endangering the plaintiff's premises by fire or smoke.

His Lordship, addressing Mr. Stuart Smith, who represented the plaintiff, said that it was not a matter which could be settled by him.

Mr. Stuart Smith replied that he was going to suggest to his learned friend who represented the defendant whether he could not give an undertaking in the terms of the latter part of the notice of motion.

His Lordship: "Not to endanger"? That cannot be done unless some person is called in to say whether what the defendant has done is calculated to endanger.

Counsel for the defendant said that it did seem, on the evidence, that there was one particular fireplace which had caused some discomfort to the plaintiff by reason of the defendant having burnt shavings in it. The defendant would undertake not to burn shavings in that one particular grate.

His Lordship: Or anything else?

The learned counsel assented, and said that there was an empty grate which would be filled up.

His Lordship: Is that the worst part of the cause of action?

Mr. Stuart Smith replied that there were two points in the case. One was, that the defendant had broken into the plaintiff's flue.

His Lordship: What do you suggest should be done?

Mr. Stuart Smith said that he should suggest that the defendant should remove an obstruction which he had placed in that flue. The defendant was building a new floor, and one of the joists supporting that building had got into the flue and so obstructed the chimney, which caused it to smoke. The defendant had built a fireplace on his first-floor, on the other side of the flue, and had used the flue himself, putting in a flag which covered the plaintiff's chimney, causing it to smoke.

His Lordship said that he was afraid he could not assist either of the learned counsel to be reasonable in the matter. The defendant must not leave the flag there. It was a very important matter for him, because he would be subject to damages if he was wrong.

Counsel for the defendant said that his client wished that the matter might stand over for a fortnight in order that he might in the meantime reply to the plaintiff's evidence.

His Lordship: No, no; in order in the meantime that you may do your best to remedy the defect. I shall not expect to see either of you gentlemen again in this case, and I sincerely hope I shall not. I want you to settle this matter if you can, and I therefore direct that it shall not again come into the paper unless you, or one of you, certify that it must.

In the event of a settlement not being arrived at, his Lordship directed that pleadings should be delivered during the Vacation, and gave liberty to apply to expedite the trial.

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

COMPETITIONS.

Nature of Work.	By whom Advertised.	Premiums.	Designs to be delivered.
*Rectory	St. Nicholas (Galway) Select Vestry	10*l.* and 5*l.*	Sept. 25
*Sewerage and Water Supply Scheme	Linslade Parochial Committee	20 guineas & 10 guineas	Oct. 8

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
Well-Sinking, Laverstock Green	St. Albans R.D.C.	M. Woolman	Sept. 3
Cast-iron Water Pipes and Laying (4,400 yards)	Morpeth Corp.	*Official*	do.
Extension of School, Trewbart	Llanwonno (Wales) School Board	A. O. Evans	Sept. 4
*Road-making Works	Southend-on-Sea Corp.	H. Harlock	do.
*Vagrant Wards at Workhouse	Westhampnett Union	*Official*	Sept. 5
*Reconstruction Hot-water Apparatus at Workhouse	do.	do.	do.
*Heating Apparatus at Infirmary	St. Pancras Guardians	do.	do.
Machine Shop, Testing Department, &c. Rugby	Willans & Robinson	T. W. Willard	do.
Waterworks, Broughton	Edinburgh Water Trus.	Jas. Wilson	do.
Two National Schools, Cappawhite, co. Tipperary	Rev. J. R. Crone		Sept. 8
Schools, Harpfield	Stoke-on-Trent Sch. Board	R. Scrivener & Sons	Sept. 9
*Wagons and Carts	Torquay Town Council	H. A. Garrett	do.
*Sewer, New Eltham		Logsdail & Beale	do.
*(1) Removal of Dust, &c. (2) Supply of Barges, &c.	Islington Vestry	*Official*	do.
*Branch Post-office, Stratford	Com. of H.M. Wks, &c	do.	do.
Station Buildings, Wrangaton, Devon	G. W. Ry. Co.	do.	Sept. 10
Refuse Destructor (4-cell)	Southampton Corp.	W. B. G. Bennett	do.
Schools, Ripplesidе	Barking Sch. Bd.	C. J. Dawson	Sept. 11
*Ward Pavilions and Workshops, S. E. Fever Hospital	Met. Asylums Board	T. W. Aldwinckle	Sept. 12
*Saleshops, Offices, &c. Sheffield	Trus. late G. H. Foster	Flockton & Gibbs	do.
Reconstructing Albert Pier Head, Jersey	Harbour, &c. Com.	*Official*	Sept. 13
*Apparatus for Emptying Cesspools	Dartford R.D.C.	E. R. Boulter	Sept. 14
Service Reservoir, Filter Beds, &c.	Great Torrington (Devon Water Co. Lim.	W. C. Medland	do.
Electric Lighting Works, Ireland	Queenstown T.C.	R. Hammond	Sept. 16

CONTRACTS—*Continued.*

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
School Enlargement, Whiteley Wood	Sheffield School Board	*Official*	Sept. 16
*Underground Telephones, &c.	Manchester Corp.	do.	Sept. 17
*Roadmaking and Sewer Works	Acton Dist. Council	D. J. Ebbetts	do.
*Lavatories—Boundary Walls, &c.	Exmouth U.D.C.	J. Johnson	Sept. 18
*Water Supply Works	Lyme Regis Corp.	Witts & Phillott	Sept. 19
Branch Railway Line, Manchester Ship Canal	Lancs & Yorks Ry. Co.	*Official*	Sept 24
*New Hospital and Reception Wards	Lancashire Asy. Bd.	Simpson & Duckworth	Sept. 28
*Temporary Iron Structures	London County Council (Asylums Committee)	*Official*	Sept. 30
Farm Buildings, near Petersfield, Hants	Wm. Nicholson	Crickmay & Son	No date
Residence, Broadway, Peterborough	T. H. Watson	M. Hall	do.
Boiler-house, &c. Underwood, Devon	Plympton St. Mary Un.	*Official*	do.
Chancel, St. Mark's Church, New Swindon, Wilts		M. Temple Moore	do.
Additions to Marischal College, Aberdeen		A. M. Mackenzie	do.
Residence, Paley-road, Bowling, Bradford, Yorks		Empsall & Clarkson	do.
School Buildings, Great Cressingham	W. R. Goulder		do.
House, Perranporth, near Truro	W. Trevelian		do.
Two Houses, West Cliff-terrace, Harrogate	F. Shaw		do.
Galvanised Iron Church, Clara Vale Colliery, near Wylam, Northumberland	James Archbold		do.
Three Long Sheds, Church Farm, Deeping St. Nicholas, Lincs	S. & G. Kingston		do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in.
*Teachers of Trade Classes	Wandsworth Technical Institute		Sept. 2
*Surveyor	St. George-the-Martyr Southwark Vestry	250*l.* &c.	do.
*Quantity Surveyor	Hackney Union		Sept. 4
*Surveyor and Engineering Assistant	Stockton-on-Tees Corp.	120*l.*	Sept. 9
*Surveyor, &c.	Chippenham U.D.C.	120*l.*	do.
*County Surveyorship	Civil Service Commrs.		Sept. 18
*Mechanical Engineer	West Ham Council	200*l.* &c.	Sept. 23

Those marked with an asterisk (*) are advertised in this Number. *Competitions, p.* iv. *Contracts, pp.* iv., vi., vii., **viii.** *and* xviii. *Public Appointments, p.* xvi.

CAPITAL AND LABOUR.

EDINBURGH JOINERS AND THEIR WAGES.—A meeting of the Edinburgh and Leith Master Builders' Association was held on the 22nd inst. in Dowell's Rooms, Edinburgh—Mr. D. Heron, President, in the chair—to consider the demand of the workmen for an increase of ½d. per hour in their wages, from 8d. to 8½d. There was a large gathering, and after discussion it was agreed that the state of trade and of the labour market did not warrant an increase.

BUILDING DISPUTE, SWANSEA.—A deputation from the Swansea Carpenters' and Joiners' Association waited on the Corporation Committee at the Town Hall recently to allege that the contractors for the new market were violating clauses in their contract by employing men other than local, and by paying carpenters 8d. an hour, whereas the trades union rate of wages was 8½d. The Committee found they had no power to deal with the question.

MEETINGS.

SATURDAY, AUGUST 31.

Northern Architectural Association.—Visit to St. Matthew's Church, Newcastle.

TUESDAY, SEPTEMBER 3.

Sanitary Institute (Lectures for Sanitary Officers).—Dr. R. T. Hewlett on "Elementary Bacteriology." 8 p.m.

Glasgow Architectural Association.—Opening address by the President, Mr. A. N. Paterson, M.A.: "History, Archæology, & Art." 8 p.m.

WEDNESDAY, SEPTEMBER 4.

Builders' Foremen and Clerks of Works' Institution.—Ordinary Meeting of the Members. 8 p.m.

FRIDAY, SEPTEMBER 6.

Sanitary Institute (Lectures for Sanitary Officers).—Mr. J. Castell-Evans, F.I.C., on "Elementary Physics and Chemistry: Mechanical Physics."—I. 8 pm.

Liverpool Engineering Society.—Visit to the Sunlight Soap-works at Bebington.

RECENT PATENTS:

ABSTRACTS OF SPECIFICATIONS.

15,834.—BRICKS: *H. Wood.*—This invention relates to the production of improved bricks from plastic clays. The clay is first mixed with some kind of combustible material, by preference dust-bin or similar refuse, and burned. The burnt clay, together with a proportion of unburnt plastic clay, is then ground. The mixture may be used by itself, or with the addition of sand, gravel, &c., for the manufacture of bricks.

17,522.—BOLTS: *W. Crombie and others.*—This invention refers to a mortice-bolt chiefly applicable to stable doors. A bolt which slides in a horizontal slot has two studs, or projections, which extend to the inside and outside respectively. Slots are provided for the studs to work in, one slot being turned upwards at each end, and the other slot turned downwards to form recesses in which the studs, being weighted, may catch and prevent the bolt from being moved by a horse or other animal.

17,613.—HINGES: *E. Spinney.*—Pertains to a hinge in two parts for boxes, &c. One part is formed with a longitudinal ridge or head, which is capable of pivotting in a corresponding groove in the other part. A slot is made in this groove, and a neck-piece, having an enlarged head, moves therein, and holds the lid, to which the hinge is applied, in position.

17,865.—WATER-CLOSETS: *W. Whitaker.*—Deals with the tipper-boxes of waste-water closets which tip automatically, and consists in casting or moulding to the tipper two lugs or projections, which, during the process of tipping, come in contact with buffers of indiarubber, which suddenly check the movement and cause the water to be thrown out with force.

8,095.—GOLD PAINT: *J. Tennant and others.*—Pertains to the manufacture of gold paint for interior gilding. One gallon bleached linseed oil is mixed with litharge and sugar of lead, and highly boiled. After cooling, it is hermetically sealed in iron flasks, and allowed to lie for some time. Benzol and benzine are afterwards added at different periods, and finally gold bronze in the proportion of eight pounds to one gallon.

10,682.—SEATS: *W. Zeggert.*—A seat or bench which may be used for divers purposes. Consists of two frames adapted to be slid one into the other, and provided with legs. A rack is fixed on the frame, and a movable part of said frame is provided with a strut which engages with the rack and holds the movable part which forms the back, at any angle.

13,154.—WALLS: *M. Church.*—Relates to an improved compound for coating and decorating walls, and for the production of casts, mouldings, &c. Consists of a compound formed by heating calcined gypsum, and adding animal glue in liquid form, with or without a small proportion of sulphate of zinc.

NEW APPLICATIONS FOR LETTERS PATENT.

AUGUST 12.—15,139, J. Brindley, Ceramic Tiles.—15,167, C. Voltz, Vaulting-bearer or Girder-facings, Building-blocks, Walls, Ceilings, &c.—15,173, H. Ostermann, Stoves.

AUGUST 13.—15,191, E. Radclyffe, Window.—15,200, J. Smith, Ventilation of house drains, sewers, &c.—15,231, W. Buck, Hollow Walls, and the method of constructing them, and in hollow, tubular, or perforated bricks therefor, and in the application thereof for ventilating, heating, and warming purposes.—15,241, W. Blair, Window-catches or Sash-fasteners.

AUGUST 14.—15,256, G. Anderson, Sash-frames of Windows.—15,299, The Simplex Window Fitting Co., Limited, and P. Daw, Fastenings for Window-sashes.

AUGUST 15.—15,333, C. Bush, Roofing Tiles.—15,339, M. McNamara, Flushing Cisterns.

AUGUST 16.—15,385, F. Gibbons, Fanlight Openers.—15,393, S. Mason, Syphon Flushing Cisterns.—15,419, G. and J. Rushworth, Stone Sawing Machinery.—15,442, G. Wright, Appliance for use in the erection of Scaffolds, &c.—15,458, A. Diederichsen, Wood Planing and Milling Machines.—15,463, J. Chalmers, Door-fasteners.

AUGUST 17.—15,488, R. Strong, Artificial Marble, Stone, Wood, &c.

PROVISIONAL SPECIFICATIONS ACCEPTED.

13,687, W. Adcock. Drain and Sewer Pipes.—13,888, H. Vick, Water Closets.—14,187, A. Hirsch, Vitreous Artificial Stone.

COMPLETE SPECIFICATIONS ACCEPTED.

(Open to Opposition for Two Months.)

17,701, A. Lyster, Excavating and Dredging Apparatus.—19,325, T. Mossman, Fireproof Floors and Roofs.—19,711, B. Dawson, Kilns for Burning Pottery, Bricks, &c.—2,354, T. Jeffery, Door or Portière Rods.—13,667, P. Bruns, Roofing Tiles.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

AUGUST 15.—By *Debenham, Tewson, & Co.* (at Scarborough): Two freehold cottages, Staintondale, Yorks., and 8 a. 3 r. 3 p., 390*l.*; "High Peak Farm," and 96 a. 3 r. 14 p., f., r. 47*l.*, 1,000*l.*; two enclosures of land, Cloughton, Yorks., 12 a. 0 r. 39 p., f., 80*l.*; "Skelton Bank Wood," Fylingdales, Yorks., containing 4 a. 3 r., f., 60*l.*; "Prospect Farm," Staintondale, Yorks., containing 38 a. 1 r. 32 p., f., 700*l.*

AUGUST 16.—By *Debenham, Tewson, & Co.* (at Sunderland): "Salem House," Salem-st., Sunderland, c., r. 45*l.*, 700*l.*; "Salem Cottage," c., r. 24*l.*, 415*l.*; 8, Tavistock-pl., c., r. 25*l.*, 530*l.*; 55 to 59, 63 and 65, Tatham-st, c., r. 148*l.*, 2,405*l.*

AUGUST 20.—By *Bean, Burnett, & Eldridge:* 62, Westow Hill, Norwood, f., r. 100*l.*, 2,460*l.*

AUGUST 22.—By *W. R. Manning & Co.:* 14 to 32 even, Dundonald-rd., Wimbledon, u.t. 37 yrs., g.r. 175*l.*, 120*l.*

[*Contractions used in these Lists.*—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard, &c.]

PRICES CURRENT OF MATERIALS.

TIMBER.		
Greenheart, B.G.	ton	8/0/0 9/0/0
Teak, E.I.	load	10/0/0 16/0/0
Sequoia, U.S. ft. cu		1/10 2/2
Ash, Canada	load	2/15/0 4/0/0
Birch, do.		2/5/0 3/10/0
Elm, do.		3/10/0 4/15/0
Fir, Dantsic, &c.		1/15/0 3/10/0
Oak, do.		2/15/0 4/15/0
Canada		6/0/0 7/10/0
Pine, Canada red		0/0/0 0/0/0
Do. Yellow		2/15/0 5/0/0
Lath, Dantsic, fath		4/10/0 5/10/0
St. Petersburg		5/0/0 6/10/0
Wainscot, Riga, &c., log		4/10/0 6/10/0
Odessa, crown		4/10/0 6/10/0
Deals, Finland 2nd & 1st std	100	7/0/0 8/10/0
Do. 4th & 3rd		7/0/0 8/0/0
Do. Riga		7/0/0 8/0/0
St. Petersburg, 1st yellow		9/10/0 12/0/0
Do. 2nd yellow		7/10/0 9/0/0
Do. white		8/0/0 9/10/0
Swedish		7/0/0 15/10/0
White Sea		7/10/0 15/0/0
Canada, Pine 1st		22/0/0 24/0/0
Do. do. 2nd		16/10/0 17/10/0
Do. do. 3rd, &c.		8/5/0 10/10/0
Do. Spruce, 1st		9/0/0 10/10/0
Do. do. 3rd and 2nd		6/10/0 7/10/0
New Brunswick		6/0/0 7/0/0
Battens, all kinds		5/0/0 21/0/0
Flooring boards, sq., 1 in. prep. 1st		0/9/6 0/14/6
Do. 2nd		0/6/6 0/11/6
Other qualities		0/4/6 0/7/6
Cedar, Cuba	ft.	/3 /4
Honduras, &c.		/3 /4½
Mahogany, Cuba		/3 /6
St. Domingo, cargo av.		/3 1/0
Mexican do. do.		/3 /4
Tobasco do. do.		/3½ /6
Honduras do.		/3½ /5½
Box, Turkey	ton	4/0/0 15/0/0
Rose, Rio		7/0/0 16/0/0
Bahia		6/0/0 15/0/0
Satin, St. Domingo		0/0/5 0/1/0

TIMBER (*continued*).		
Satin, Porto Rico		0/0/6 0/1/6
Walnut, Italian		0/0/0 0/0/0

METALS.		
Iron—Pig, in Scotland	ton	2/6,8 0/0/0
Bar, Welsh, in London		5/12/6 5/15/0
Do. do. at works in Wales		5/2/6 5/5/0
Do. Staffordshire, in London		6/0/0 6/10/0
COPPER—British cake and ingot		50/15/0 51/5/0
Best selected		51/15/0 52/5/0
Sheets, strong		57/0/0 0/0/0
Chili bars		47/2 6 47/7,6
YELLOW M'TALR		0/0/4-5/16 0/0/4⅜
LEAD—Pig, Spanish	ton	11/0/0 11/2,6
English com. brands		11/1/3 11/3/9
Sheet, English, 6 lbs. per sq. ft. and upwards		12/0/0 0 0/0
Pipe		12/10/0 0/0/0
ZINC—English sheet	ton	18/10/0 0/0/0
Vieille Montagne		19/0/0 0/0/0
TIN—Straits		65/10/0 66/0/0
Australian		66/12/0 67/0/0
English Ingots		67/10/0 68/0/0
Banca		65/10/0 65/15/0
Billiton		65/0/0 65/5/0

OILS.		
Linseed	ton	20/15'0 21/2'6
Cocoanut, Cochin		23/15/0 24/0/0
Do. Ceylon		22/15/0 23/0/0
Palm, Lagos		22/15/0 0/0/0
Rapeseed, English pale		22/0/0 0/0/0
Do. brown		20/10/0 20/15/0
Cottonseed ref.		17/10/0 18/0/0
Oleine		20/10/0 21/10/0
Lubricating, U.S.		5/9/0 8/3/0
Do. black		4/6/0 6/6/0
TAR—Stockholm	barrel	c/19'6 0/0/0
Archangel		0/14'6 0/0/0

TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than* 10 *a.m. on Thursdays.*]

ABERDEEN (N.B.).—For the erection of two houses, Ballater and Aboyne, for the Town Council. Mr. Wm. Dyack, Burgh Surveyor, Town House, Aberdeen:—

Masonry.—J. Burgess & Sons, Aboyne ..... £149 10 7—each.
Carpentry.—R. Harper, Kincardine O'Niel ..... 97 12 0—at Ballater.
Ditto ditto ..... 94 12 0—at Aboyne.
Slating.—B. Mitchell, Ballater .... 19 7 0—at Ballater.
Ditto ditto .... 10 16 0—at Aboyne.
Plastering.—W. Mitchell, Ballater 28 17 5—each.

BRADFORD (Yorks.).—For the erection of nine houses, East Parade. Messrs. James Young & Co., architects, 62, Market-street, Bradford:—

Masonry.—Joseph Thornton & Co. £1,080 0
Joinery.—Walter Kellett 385 0
Plumbing.—M. Slinger & Son 49 0
Plastering.—J. & W. Bates 83 0
Slating.—Hill & Nelson 67 10
[All of Bradford.]

BROMLEY.—Accepted for rebuilding stables and coach-house to the "Plough Inn," Bromley Common, Kent, for Whitbread & Co., Ltd. Mr. Albert L. Guy, architect and surveyor, Bedford-row House, W.C.:—
Knight, Sidcup £889

CAMBRIDGE.—For two dwelling-houses and shops, Mill-road, Cambridge, for Messrs. Storey & Leaves. Mr. J. Yarrow, architect:—

T. H. Prime & Sons ..... £1,061 | J. Willmott & Sons* ... £1,051
P. Banyard ..... 1,060 | * Accepted.
[All of Cambridge.]

CARDIFF.—For the erection of warehouse and offices, 50 and 51, George-street, Cardiff, for Mr. Joseph Milner. Messrs. J. P. Jones, Richards, & Budgen, architects, 18, St. Mary-street, Cardiff:—

Lattey & Co. ..... £2,775 0 0 | Shepton & Son £2,475 10 0
D. J. Davies ..... 2,650 0 0 | David Davies 2,420 0 0
Beer & Son ..... 2,638 0 0 | E. R. Evans Bros. ... 2,400 10 3
Cox & Bardo ..... 2,506 0 0 | William Thomas & Co. 2,260 0 0
Knox & Wells ..... 2,497 0 0 | James Allen* 2,162 0 0
* Accepted.
[Architect's estimate, £2,200 7s. 9d.]

CHISELHURST.—For the erection of a villa-residence for Mr. E. Norfolk, jun. Mr. B. W. Adkin, architect, 14, Queen-street Cheapside, E.C.:—

J. Smith & Son .... £1,997 0 0 | J. Otway* £1,445 0 0
W. Mills ..... 1,740 0 0 | G. J. Kirk 1,279 0 0
A. Moss ..... 1,627 5 7 | * Accepted.

CHISELHURST.—For the erection of stabling, &c., to the "Tiger's Head" Hotel, for Mrs. Griffiths. Mr. B. W. Adkin, architect, 14, Queen-street, Cheapside, E.C.:—

T. D. Leng ..... £530 | H. L. Holloway £514
John Otway ..... 529 | W. Mills (accepted) 439
T. Knight 522

CHISELHURST.—Accepted for the erection of man's rooms, over stabling and entrance-gates to the "Tiger's Head" Hotel, for Mrs. Griffiths. Mr. B. W. Adkin, architect, 14, Queen-street, Cheapside, E.C.:—
W. Mills £162

CLACTON-ON-SEA.—Accepted for six villa residences in Station-road, Clacton-on-Sea, for Mr. A. R. Chamberlayne. Mr. T. H. Baker, architect, Clacton-on-Sea:—
Ellis & Turner £3,400

COULSDON (Surrey).—For additions and alterations to the Reedham Orphanage, Coulsdon, Surrey. Mr. H. H. Bridgman, architect, 42, Poultry, E.C. Quantities by Mr. S. G. Goss, 16, John-street, Bedford-row, W.C.:—

Lidstone & Sons ..... £3,773 | Higgs & Hill £3,420
J. Mowlem & Co. ..... 3,692 | W. Scrivener & Co. 3,319
B. E. Nightingale ..... 3,678 | Perry & Co. 3,200
Colls & Son ..... 3,550 | S. R. Lamble 3,153
E. Laurence & Son ..... 3,550 | Patman & Fotheringham .. 3,051
T. Boyce 3,484

AYLESBURY.—For repaving Cambridge-street, for the Aylesbury Urban District Council. Mr. J. H. Bradford, Surveyor, Aylesbury:—

	Excavating and Forming Foundation.	Dressing Old Stones.	6 in. Lias Lime Concrete.	Relaying Stones or Granite Setts.	New 5 in. by 3 in. Mountsorrel Granite Setts.	Gully Pans and Gratings.	Connecting Gullies to Sewer.	Lighting and Watching.
	d.	s. d.	s. d.	s. d.	s. d.	£ s. d.	£ s. d.	£ s. d.
Ward & Cannon, Aylesbury*	6	1 0	1 6	1 2	6 6	2 5 0	0 7 6	5 0 0
Thomas Free & Son	3	1 6	2 6	1 8	6 0	2 10 0	0 10 0	7 0 0
William Lee & Son	3	1 2	2 0	1 3	6 6	£3 5 0		5 0 0
Taylor & Smith	6	1 0	1 8	1 2	6 9	2 7 6	1 6 6	1 0 0
William Wadey	6	1 6	2 0	1 3	9 6	6 0 0	nil.	nil.
Hockton Bros.	Labour taking up and relaying setts, 6d. per square yard.							

* Recommended for acceptance.

DURHAM.—For the erection of two cottages, Sherburn House, for the Governors of Sherburn Hospital. Mr. H. Henry, architect, 11, North Bailey, Durham:—
Thomas Whittingham, Shadforth, near Durham £455 10

EASTBOURNE.—For the supply of cast-iron pipes and cement, for the Eastbourne Corporation:—

Pipes.

Cochrane, Grove, & Co. £42,937 13 0
Macfarlane & Co. ... 37,683 2 6
Stanton Iron Works 35,475 0 0
Clay Cross Works .. 33,000 0 0
D. Stewards & Co. 32,480 0 0
Cochrane & Co. .. 31,662 10 0
Maclaren & Co. .. £31,632 0 0
Staveley Iron and Coal Co. 31,332 17 0
Roberts Bros. 29,686 0 0
Birkley Iron Works (half quality) 18,551 0 0

Cast-iron Kerb.

A. Dodman £90 5
Engineer Supply Co. 90 0
Tees Iron Works 90 0
" 80 0
J. Bagshaw & Son 76 0
W. Weekes & Sons 75 10
Staveley Iron Works £75 0
J. & S. Roberts 73 12
Birkley Iron Works Co. .. 72 0
W. Lucy £6 0
Stanton Iron Works Co.* 64 16
* Accepted.

ERITH (Kent).—For laying 16¼ miles of sewers for the Urban District Council. Contract No. 1. Mr. G. Chatterton, engineer, 46, Queen Anne's Gate, Westminster.

D. Shanks £48,805
W. Lunn 31,938
Perry & Co. 31,300
Cooke & Co. 29,700
J. Dickson 28,800
T. Adams 27,779
Baldry & Jerburgh 27,022
E. & W. Iles 25 866
A. Kellett £24,959
J. C. Bloomfield 24,497
G. Bell 24,117
Kirk & Randall 23,960
G. Osenton, Westerham* 23,037
W. Cunliffe 22,155
H. B. & A. F. James 21,869
J. Shunn 21,717
* Accepted.

FOOTSCRAY.—Accepted for sundry alterations and repairs to the "Red Lion" public-house, Footscray, for Whitbread & Co., Ltd. Mr. Albert L. Guy, architect and surveyor, Bedford-row House, W.C.:—
Knight, Sidcup £710

GODALMING.—For making-up Latimer- and Carlos-roads, for the Town Council. Mr. Samuel Welman, Borough Surveyor, Church-street, Godalming. Quantities by Borough Surveyor:—

Free & Sons £413 10 0
W. H. Wheeler 395 9 7
S. Kavanagh 381 9 1
G. A. Franks £333 15 0
Streeter Bros., East Croydon* 329 18 6
* Accepted.

GOSPORT.—For the erection of a villa residence, The Avenue, Alverstoke, for Mr. Geo. Churcher. Mr. Harry A. F. Smith, architect, Gosport. Quantities by the architect:—

W. R. Light & Son £2,495
W. Hill & Co. 2,395
W. Ward 2,395
J. Croad £2,380
Chas. Sear & Son 2,339
C. M. Dash* 2,188
* Accepted.

HARROGATE.—Accepted for Pannal Schools, Harrogate. Mr. T. A. Buttery, architect:—

Masonry.—J. Stephenson, Harrogate £1,900 0 0
Joinery.—J. Walker & Sons, Rawdon 720 0 0
Plumbing.—T. Dickenson, Middlesbro' 262 0 0
Plastering.—Laycock Bros., Harrogate 166 0 0
Slating.—J. & W. Baynes, Harrogate 389 0 0
Painting.—Geo. Dent, Harrogate 64 12 5
£3,501 12 5

HEANOR (Derbyshire).—Accepted for the erection of four shops, Market-place, for Mr. Robt. Sheldon. Mr. Henry Harper, architect, Market-place, Nottingham. Quantities by the architect:—
W. Oldershaw & Son, Heanor £1,650

KENDAL.—For the erection of engine-house, &c., at the Gas Works, for the Town Council. Mr. T. N. Ritson, C.E., Gas Works, Parkside-road, Kendal:—

Building, Plastering, and Slating.

Hill & Dixon ..... £160 0 0 | J. W. Howie, Gilling Gate* £107 12 6

Joinery.

Nelson Bros. ..... £133 0 0 | Hayes & Parkinson .. £117 6 6
W. Hutchinson ..... 125 5 6 | Martindale, Kendal* 115 0 0

Plumbing, Painting, and Glazing.

Lyon ..... £63 10 3 | W. Jackson, Kendal* £59 17 11

Iron-work.

H. H. Day, Kendal* £6 18
* Accepted.

LONDON.—For drainage and repairs at Belle Vue, East Finchley. Mr. Thomas Dinwiddy, F.S.I., surveyor:—

Killingback ..... £257 | Wills £249

LONDON.—For sundry alterations, repairs and decorations, to Lewisham Cemetery, for the Burial Board, Parish of Lewisham. Mr. Albert L. Guy, architect and surveyor, Bedford-row House, W.C.:—

Amos ..... £503 0 | Bennett £347 0
W. & D. Brown ..... 425 15 | Mills, Westcombe-park* 331 0
Sykes ..... 415 0 | * Accepted.

LONDON.—For sundry alterations and repairs to "Manor Lodge," Old-road, Lee, S.E., for Mr. J. W. Fox. Mr. Albert L. Guy, architect and surveyor, Bedford-row House, W.C.:—

Kennard Bros. ..... £592 | Jerrard £451
Watt ..... 587 | Murray, Wapping* 400
Simmonds ..... 497 | * Accepted.

LONDON.—Accepted for the erection of three villa-residences on the "Woodlands" Estate, Peckham Rye, for Messrs Simpson, Palmer, & Winder. Mr. Albert L. Guy, architect and surveyor, Bedford-row House, W.C.:—
Kennard Bros., Lewisham Bridge £1,200

LONDON.—For an improved sanitary system, &c., at 19, Penywern-road, Earl's Court, for Mr. James Hunt. Mr. B. W. Adkin, sanitary surveyor, 14, Queen-street, Cheapside, E.C.:—

T. Simpson & Son ..... £304 0 | E. T. Nye £259 10
Slaughter & Son ..... 297 0 | W. Mills (accepted) 245 0

LONDON.—For the exterior painting of Lant-street Board School, for the School Board for London. Mr. T. J. Bailey, Architect:—

Lathey Bros. ..... £159 | Nightingale £98
Gurling ..... 132 | Johnson & Co. 92
Dove Bros. ..... 130 | Kid-Kent Building Co. 89
Leek & Hooker ..... 124 | Marchant & Hirst 81

LONDON.—For exterior painting of Netherwood-street Board School, for the School Board for London. Mr. T. J. Bailey, Architect:—

Yerbury & Son ..... 218 0 0 | Chinchin £176 15 0
Neal ..... 198 0 0 | Cowley & Drake 158 0 3
Chappell ..... 192 0 0 | Cruwys 150 0 0
Callow ..... 189 10 0 | Marchant & Hirst 149 0 0
Salter ..... 184 10 0 | Eady 147 5 8

LONDON.—For exterior and interior painting of Victoria-place Board School, for the School Board for London. Mr. T. J. Bailey, Architect:—

Stevens Bros. ..... £559 | McCormack £414
Marchant & Hirst ..... 469 | T. Cruwys 4-7

LONDON.—For the exterior painting of Pritchard's-road Board School, for the School Board for London. Mr. T. J. Bailey, Architect:—

Craig ..... £245 | White & Son £127
Harvey ..... 203 | Marchant & Hirst 118
Silk & Son ..... 137 | Harrison & Spooner 106

LONDON.—For exterior repairs and painting of Farncombe-street Board School, for the School Board for London. Mr. T. J. Bailey, Architect:—

H. J. Williams ..... £276 | Johnson & Co. £149
Leek & Hooker ..... 245 | Marchant & Hirst 117
Wood & Co. 107

LONDON.—For exterior painting of Canal-road Board School, for the School Board for London. Mr. T. J. Bailey, Architect:—

Craig ..... £229 0 0 | Stevens Bros. £121 10 0
Dove Bros. ..... 164 0 0 | Grover & Son 118 0 0
Corferfield ..... 135 0 0 | Staines & Son 108 0 0
Gavin Bros. ..... 126 12 8 | Marchant & Hirst 99 0 0

LONDON.—For the erection of stables, engine-room, and hay-loft, &c., Douglas-street, Vauxhall Bridge-road, for Mr. Thos. Cane. Mr. Arthur A. Kemp, architect, 82, Vauxhall Bridge-road. Quantities by architect:—

Alfred ..... £5,029 5 | Goldfinch 4,112 0
Coleman & Co. ..... 4 338 0 | Battley, Sons, & Holness 4,089 0
Castle ..... 4,249 0 | Cornelius* 3 980 0
Lascelles 4,200 0
Fortesque 4,160 0
* Accepted subject to modification.

LONDON.—For new shop-front at 24, Stamford-street, Blackfriars, S.E. Mr. H. H. Bridgman, architect, 42, Poultry, E.C. Quantities by Mr. S. G. Goss, 16, John-street, Bedford-row, W.C.:—

E. Toms ..... £389 | H. Brown £297
T. Daniell ..... 384 | J. Harvey 297
W. Shurmur ..... 365 | J. O. Richardson 270
J. Appleby ..... 355 | J. MacLachlan & Sons 270
H. J. Williams ..... 330 | J. Lidstone & Son 246

NEW BROMPTON (Kent).—For the erection of twenty villa-residences. Mr. E. J. Hammond, architect, 111, High-street, New Brompton:—

West Bros. ..... £6,250 0 | Horsecroft & Mills £5 400 0
J. L. Trueman ..... 6.100 0 | C. E. Skinner 5,320 0
A. W. Jordan ..... 5,800 0 | H. Harris, New Brompton* 5,120 0
J. Wilford ..... 5,600 0 | F. Hammond 4,910 0
E. E. Smith } ..... 5,580 0 | G. E. D. Woollard† .. 4,752 10
A. Weymouth, }
[Architect's estimate, £5,300.]
* Accepted. † Withdrawn.

NEWCASTLE (Staffs.).—For the erection of five houses, Northcote-place. Mr. Elijah Jones, architect, 10, Albion-street, Hanley. Quantities by the architect:—

John York & Thos. Goodwin ..... £4,500 | C. Comes £4 200
H. P. Embrey ..... 4 444 | I. Godwin 4 200
J. Gallimore ..... 4,250 | C. Cope, Tunstall* 4,006
* Accepted.

NEWCASTLE-ON-TYNE.—For alterations, &c., to Primitive Methodist Chapel, North Seaton. Messrs. Davidson & Bendle, architects, 33, Grainger-street West, Newcastle-on-Tyne:—
J. N. Heatley, Delaval-terrace, Blyth, Northumberland £374 18 2

NEWPORT PAGNELL.—For the erection of school buildings, for the School Board of Newport Pagnell (Bucks.). Mr. Wm. Hull, architect, 12, St. Giles'-street, Northampton. Quantities by architect:—

White ..... £9,680 0 0 | Green Bros. £8,550 0 0
Coleman ..... 9,235 14 0 | Fathers 8,393 16 0
Henson ..... 8,957 0 0 | Heap 8,343 0 0
Branson ..... 8,683 0 0 | Sturges & Sons 8,171 18 3
Hawtin 8,678 0 0

ORPINGTON (Kent).—Accepted for additions and repairs to farm buildings. Mr. St. Pierre Harris, architect, &c., 8, Ironmonger-lane, E.C., and Orpington:—
Somerford & Son, Orpington £298

ORPINGTON (Kent).—Accepted for the erection of a pair of labourers' cottages, and for other works of repair, &c. Mr. St. Pierre Harris, architect:—
Stebbings & Pannett, Sidcup £454

ORPINGTON (Kent).—For additions and alterations to houses. Mr. St. Pierre Harris, architect, &c., 8, Ironmonger-lane, E.C., and Orpington :—

Gregory & Co.	£2,127	Somerford & Son, Chapham and Orpington*	£1,699
W. A. Grubb	1,810		
Lawrence & Son	1,750		

* Accepted.

ORPINGTON (Kent).—Accepted for erection of two detached cottages. Mr. St. Pierre Harris, architect, &c., 8, Ironmonger-lane, E.C. :—

Somerford & Son £631

[No competition.]

ORPINGTON (Kent).—Accepted for alterations and repairs to private house. Mr. St. Pierre Harris, architect, &c., 8, Ironmonger-lane, E.C., and Orpington :—

Somerford & Son £258

PADIHAM (Lancs.).—For the erection of semi-detached villa-residences, Burnley-road, Padiham, for the Rev. J. Lee and Mr. W. Helm. Mr. V. Dunkerley, architect, Padiham and Burnley. Quantities by architect :—

Benj. Smith	£800	Foster & Sons	£47
Waddington & Bertwistle	340		

PAIGNTON.—For the erection of stores, stabling, and dwelling-house, adjoining G. W. Railway Goods Yard, for Mr. W. Lambshead. Mr. W. G. Couldrey, architect. Quantities by Mr. Vincent Cattermole Brown :—

E. P. Bovey	£2,695	H. P. Rabbich	£1,961
R. Harris	2,025	Hy. Webber & Son, Paignton (accepted)	1,868
C. & R. E. Drew	1,988		

ROTHERHAM.—For the erection of police offices and courts, for the Corporation of the Borough of Rotherham. Mr. Richard J. Lovell, architect, 46, Queen Victoria-street, London :—

Chadwick	£11,570 0	S. Warburton	£9,100 0
W. Ives & Co.	10,646 0	A. T. Ripley	9,095 0
G. H. Smith	10,300 0	Richard Snell, Rotherham*	9,092 0
S. Snell	9,728 0	H. Arnold & Son†	8,785 0
W. Binns	9,447 12		
Thornton & Son	9,365 0		

* Accepted. † Withdrawn.

SOUTHPORT.—For the erection of the first portion of extensions to "Belle Vue," Southport, for Sir George A. Pilkington, J.P. Mr. C. Sydney Ingham, architect, Southport. Quantities by the architect :—

Fairbridge & Hatch	£3,295 0 0	J. Fenton & Son	£3,100 0 0
W. H. Foster	3,231 3 0	Duxfield Bros.*	3,099 17 6
Wishart & Irving	3,130 0 0		

* Accepted.

[All of Southport.]

SPENNYMOOR (Durham).—For the erection of business premises, High-street, for Mr. Dodshon. Mr. H. Henry, architect, 11, North Bailey, Durham :—

Robert Telfer, Craddock-street, Spennymore, County Durham £714

SWANLEY (Kent).—Accepted for the erection of six cottages at Moultain Hill. Mr. St. Pierre Harris, architect, &c., 8, Ironmonger-lane, E.C., and Orpington :—

Stebbings & Pannett £1,189

TENBURY.—For the execution of waterworks (four contracts), for the Rural District Council. Mr. W. Wyatt, engineer, Pride Hill Chambers, Shrewsbury :—

Contract 4 (Tanks).

T. Preece	£1,050 16 8	T. Brown, Shrewsbury (accepted)	£809 0 0
H. Roberts	1,018 2 0	B. Griffin	799 2 11
W. L. Meredith	936 19 10	C. Edwards	796 0 0
Davies & Son	925 5 9		

	Per Ton.	
Iron Pipes.—H. Roberts, West Bromwich	£4 3 0	Accepted on Schedule of Prices.
Pipe Laying.— " " " "		
Valves and Hydrants.—Blakeborough & Sons, Brighouse		

WAKEFIELD.—Accepted for spinning mill, chimney stock, and other buildings, at Wakefield, for Messrs. Alfred Haley & Co. Mr. William Watson, architect, Wakefield :—

Excavating, Brick, and Stonework.—Bagnall Bros.	£6,774 17 11
Slating.—Wm. Atkinson	
Plastering.—T. C. Tattersall	
Carpentry and Joinery.—Bramald & Broadhead	
Plumbing and Glazing.—Samuel Atkinson	
Ironfounding.—Harrison & Hammond	
Painting.—Chas. Turner & Sons	

[Seventy-two Tenders received].

SUBSCRIBERS in LONDON and the SUBURBS, by prepaying at the Publishing Office, 19s. per annum (or 4s. 9d. per quarter), can ensure receiving "The Builder," by *Friday Morning's Post*.

TO CORRESPONDENTS.

J. L. F.—R. S. D. (amounts should have been stated).—"Undecided" (should have given your name and address).—H. C. (amount should have been stated).

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

We cannot undertake to return rejected communications.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor.

PUBLISHER'S NOTICES.

Registered Telegraphic Address, 'THE BUILDER,' LONDON.

THE INDEX, with TITLE-PAGE, for Volume LXVIII. (Jan. to June, 1895) was given as a supplement with the number for July 13.

CLOTH CASES for Binding the Numbers are now ready, price 2s. 6d. each; also

READING CASES (Cloth), with Strings, price 9d. each, also

THE SIXTY-EIGHTH VOLUME of "The Builder" (bound), price Twelve Shillings and Sixpence.

SUBSCRIBERS' VOLUMES, on being sent to the Office, will be bound at a cost of 3s. 6d. each.

CHARGES FOR ADVERTISEMENTS.

SITUATIONS VACANT, PARTNERSHIPS, APPRENTICESHIPS, TRADE AND GENERAL ADVERTISEMENTS.

Six lines (about fifty words) or under ..... 4s. 6d.
Each additional line (about ten words) ..... 0s. 6d.

Terms for series of Trade advertisements, also for Special Advertisements on front page, Competitions, Contracts, Sales by Auction, &c., may be obtained on application to the Publisher.

SITUATIONS WANTED.

FOUR Lines (about thirty words) or under ..... 2s. 6d.
Each additional line (about ten words) ..... 0s. 6d.

PREPAYMENT IS ABSOLUTELY NECESSARY.

*** Stamps *must not* be sent, but all small sums should be remitted by Cash in Registered Letter or by Postal Orders, payable to DOUGLAS FOURDRINIER, and addressed to the Publisher of "THE BUILDER," No. 46, Catherine-street, W.C.

Advertisements for the current week's issue are received up to THREE o'clock p.m. on THURSDAY, but "Classification" is impossible in the case of any which may reach the Office after HALF-PAST ONE p.m. on that day. Those intended for the front Page should be in by TWELVE noon on WEDNESDAY.

SPECIAL.—ALTERATIONS IN STANDING ADVERTISEMENTS or ORDERS TO DISCONTINUE same must reach the Office before 10 a.m. on WEDNESDAY MORNING.

The Publisher cannot be responsible for DRAWINGS, TESTIMONIALS, &c., left at the Office in reply to advertisements, and strongly recommends that of the latter COPIES ONLY should be sent.

PERSONS Advertising in "The Builder," may have *Replies addressed to the Office, 46, Catherine-street, Covent Garden, W.C., free of charge.* Letters will be forwarded if addressed envelopes are sent, together with sufficient stamps to cover the postage.

AN EDITION Printed on THIN PAPER, for FOREIGN and COLONIAL CIRCULATION, is issued every week.

READING CASES, { NINEPENCE EACH. By Post (carefully packed), 1s.

W. H. Lascelles & Co.,

121, BUNHILL ROW, LONDON, E.C.

Telephone No. 270.

HIGH-CLASS JOINERY,

LASCELLES' CONCRETE

Architects' Designs are carried out with the greatest care.

CONSERVATORIES,

GREENHOUSES,

WOODEN BUILDINGS,

Bank, Office, & Shop Fittings.

CHURCH BENCHES & PULPITS.

ESTIMATES GIVEN ON APPLICATION.

TERMS OF SUBSCRIPTION.

"THE BUILDER" is supplied DIRECT from the Office to residents in any part of the United Kingdom, at the rate of 19s. per annum PREPAID. To all parts of Europe, America, Australia, New Zealand, India, China, Ceylon, &c., 26s. per annum. Remittances (payable to DOUGLAS FOURDRINIER) should be addressed to the publisher of "THE BUILDER," No. 46, Catherine-street W.C.

THE BATH STONE FIRMS, Ltd.

BATH,

FOR ALL THE PROVED KINDS OF

BATH STONE.

FLUATE, for Hardening, Waterproofing, and Preserving Building Materials.

DOULTING STONE.

CHARLES TRASK & SONS,

(THE DOULTING STONE COMPANY),

DOULTING, SHEPTON-MALLET.

London Agent:

E. A. WILLIAMS, 16, Craven-st., Strand, W.C.

HAM HILL STONE.

The attention of Architects is specially invited to the durability and beautiful COLOUR of this material. Quarries well opened. Quick despatch guaranteed. Stonework delivered and fixed complete. Samples and estimates free. Address, The Ham Hill Stone Co., Norton, Stoke-under-Ham, Somerset. London Agent: Mr. E. A. Williams, 16, Craven-st., Strand, W.C. [ADVT.

Asphalte.—The Seyssel and Metallic Lava Asphalte Company (Mr. H. Glenn), Office, 42, Poultry, E.C.—The best and cheapest materials for damp courses, railway arches, warehouse floors, flat roofs, stables, cow-sheds and milk-rooms, granaries, tun-rooms, and terraces. Asphalte Contractors to the Forth Bridge Co. [ADVT.

SPRAGUE & CO.,

STATIONERS, &c.,

Keep a Special Stock of Sundries for Professional Offices.

4 & 5, East Harding-st., Fetter-lane, E.C. [ADVT.

QUANTITIES, &c., LITHOGRAPHED accurately and with despatch.

METCHIM & SON, 20, Parliament-st. S.W.

"QUANTITY SURVEYORS' TABLES,"

For 1895 price 6d. post 7d. In leather 1/- Post 1/1 [ADVT

PILKINGTON & CO

(ESTABLISHED 1838),

MONUMENT CHAMBERS,

KING WILLIAM STREET, LONDON, E.C.

Registered Trade Mark,

Polonceau Asphalte.

PATENT ASPHALTE and FELT ROOFING.

ACID-RESISTING ASPHALTE.

WHITE SILICA PAVING.

SEYSSEL ASPHALTE.

PRISM ANTIOXIDE Reg.

Gold Medal, Midland Counties' Industrial Exhibition, 1891. Certificate of Merit, Sanitary Institute of Great Britain, Worcester, 1881.

SURE PREVENTATIVE OF RUST ON ALL KINDS OF IRON, STEEL, AND OTHER METALS.

PROTECTOR OF PAINT ON WOOD OR IRON. PRESERVATIVE OF ADVERTISEMENT BILLS EXPOSED TO THE WEATHER.

FINEST MATERIAL FOR PRODUCING ENAMEL PAINTS.

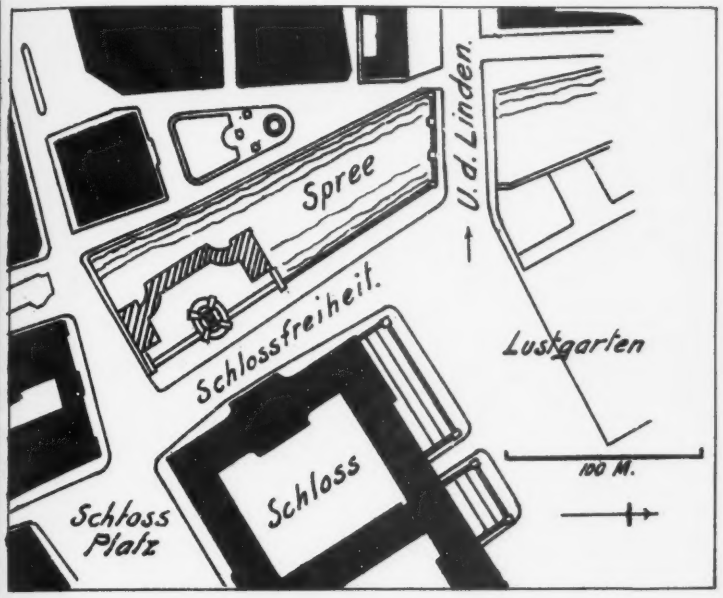
Used by all the leading Railway Companies, Iron Founders, Machine Makers, &c., mixed with Paint, or on Paint, for Iron Bridges, Girders, &c., also on Wood Painted with Carbolineum.

INDESTRUCTIBLE COMBINATION WASHERS.

For Flange Joints of Steam and Water Pipes, tested up to 2,300 lbs. pressure.

These Washers consist of rings of soft metal, grooved outside, and holding in the groove packing material, such as Asbestos, Rubber, Hemp, &c., &c. The soft metal, in conjunction with the packing included, will accommodate itself readily to any unevenness in unplaned flanges, and make a perfect and durable joint. It is impossible, owing to their construction, to blow them out under any pressure whatever.

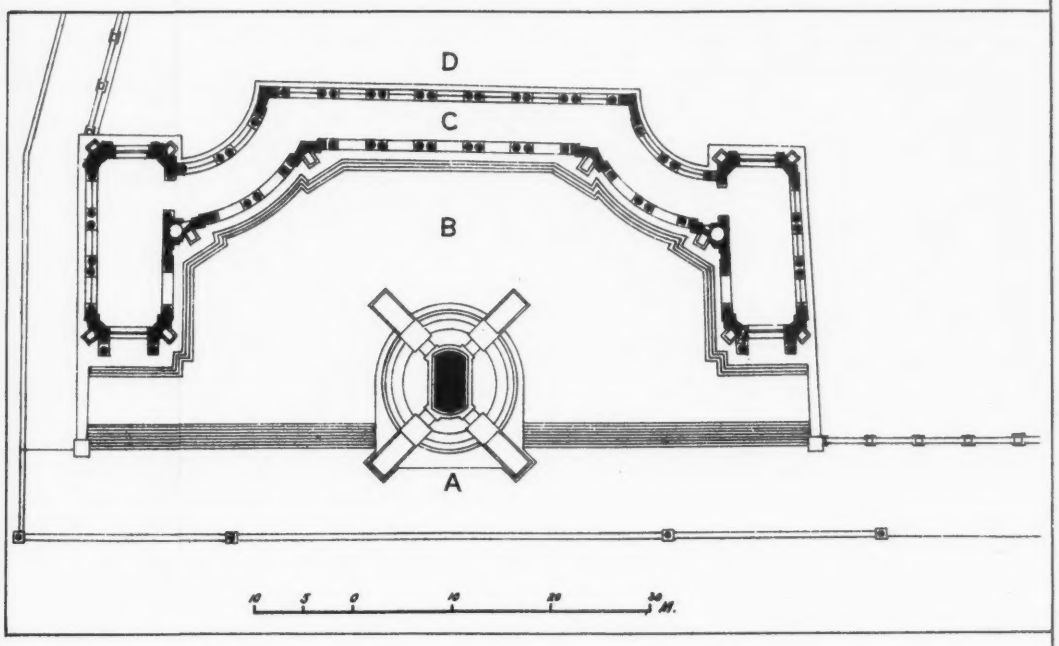
PETERS, BARTSCH, & CO., DERBY. London Office, 68, QUEEN STREET, CHEAPSIDE, E.C.



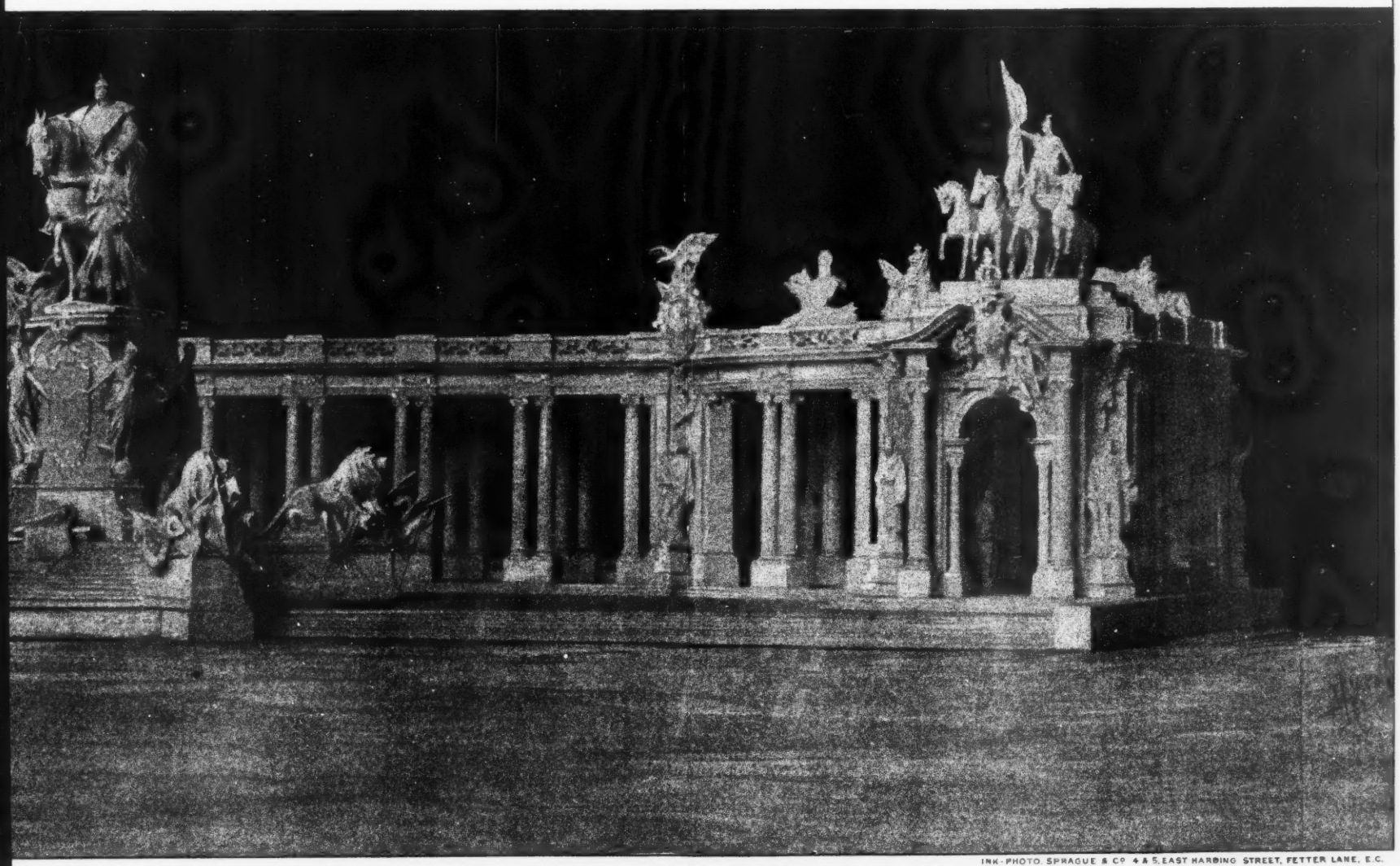
PLAN OF SITE.

NATIONAL MONUMENT TO EMPEROR WILLIAM I., BERLIN.—Herr Rein

A. Equestrian Statue.
B. Terrace.
C. Colonnade.
D. River Spree.



PLAN OF MONUMENT.



INK-PHOTO. SPRAGUE & Co 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

LIAM I., BERLIN.—HERR REINHOLD BEGAS, SCULPTOR; HERR GUSTAV HALMHUBER, ARCHITECT.

PHOTO-LITHO. SPRAGUE & Co 4 & 5 EAST HARDING STREET FETTER LANE

BUSINESS PREMISES, SALISBURY SQUARE, E.C., FOR MESSRS. EDWARD LLOYD, LTD.

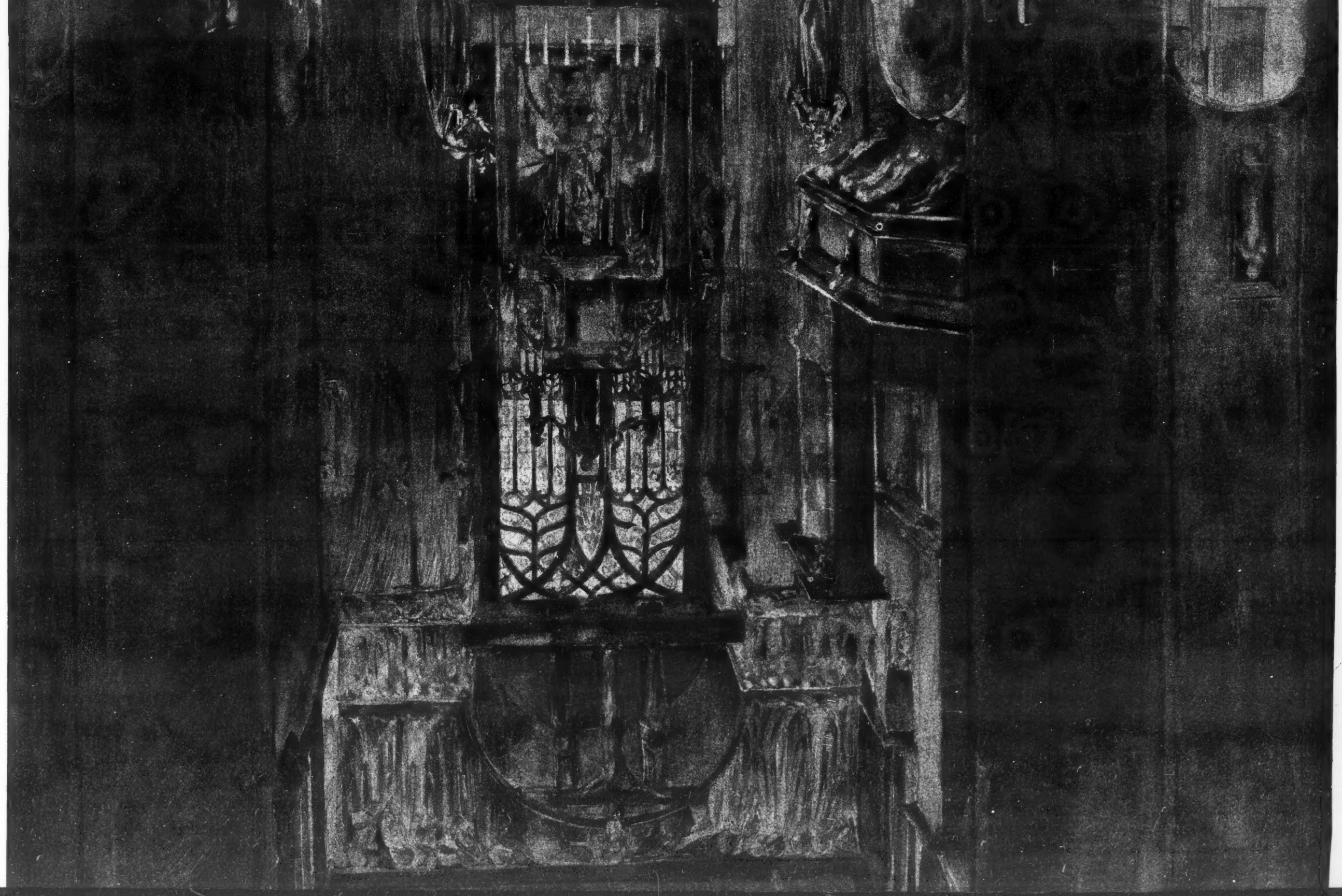
MR. H. L. FLORENCE, F.R.I.B.A., ARCHITECT.

ASHTON GRAMMAR SCHOOL DUNSTABLE

ROBSON & SON
ARCHITECTS
PALACE CHAMBERS
WESTMINSTER

PHOTO-LITHO SPRAGUE & Co 4 & 5 EAST HARDING STREET FETTER LANE E.C.

THE BUILDER, AUGUST 31, 1895.



INK-PHOTO. SPRAGUE & Co 4 & 5 EAST HARDING STREET, FETTER LANE, E.C.

STUDY FOR INTERIOR OF PROPOSED CHURCH, ST. ANDREW'S, BOSCOMBE.—Mr. H. Wilson, Architect.